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Design as Influenced by Circumstance.

TO formulate a short, comprehensive, and attractive title for a book dealing with a very large subject, and with various aspects of it, is often a difficulty. In selecting the title "The Bases of Design" for the collective publication of his lectures delivered to the students of the Manchester Municipal School of Art,* Mr. Walter Crane has succeeded in satisfying those conditions, but (as is not unfrequently the case) rather at the expense of accuracy of definition. The title suggests a more serious and philosophical work than this can be said to be ; and though race and climate, for example, undoubtedly influence design, we do not see that they can be well said to be among the bases of the art ; they are circumstances which modify it. The title we have given to this article would more correctly describe a great part of the contents of Mr. Crane's book ; but we admit that it would not look nearly so attractive in a publisher's catalogue.

The first two chapters, however, on "The architectural basis" and "The utility basis," do come properly under the heading of the title ; they deal with causes which are actually at the root of the forms and methods of design. We do not know that they contain anything very new ; but in a book addressed mainly to students truth is more important than novelty. At the outset of the first chapter the author, indeed, dignifies his subject by drawing attention to one aspect of it which is often overlooked ; its immense and far-reaching importance in the history of mankind, the endless complexity of the forms which the word "design" covers, the enormous range from, say, the grass mat of the first plaiter to the finest Persian carpet, or from Stonehenge to Salisbury Cathedral "and were we to attempt to trace, step by step, the true relation between the diverse and multitudinous characteristics which such contrasts suggest, we should be tracing the cause of the development of human thought and history themselves." This is going a little too far, for one does not see how Aristotle and Bacon, Averroes and Spinoza, are to be included under the history of design, but it is pardonable exaggeration on the part of an artist who recognises truly that the subject, is at all events, far greater and more significant than the majority of persons realise.

Mr. Crane, like a good many other decorative artists of the modern epoch, finds the original and controlling bases of design in architecture, "the queen and mother of all the arts." In asserting this, he adds—

"one does not lose sight of the view that *all art is primarily, the projection or precipitation in material form of man's emotional and intellectual nature ;* but, being projected and taking definite shape, it becomes subject to certain controlling forces of nature, of material, of condition, which re-act upon the mind ; and it is with these controlling forces and conditions, and the distinctions which arise out of them, that we are now concerned."

That is, in fact, a correct description of the real scope of the book, much more so than is conveyed in its actual title. The treatment of the connexion of architectural design with structure, or its origin in structure, is in the main what we are all agreed on ; it is only marred by some misconceptions into which writers who are not architects are often apt to fall in dealing with the architectural elements of design. It is vexatious to find, in a book written by an eminent artist who will be supposed by many to speak with authority, the renewed repetition of that old and exploded fallacy that in the pointed arches formed by the interlacing of round arches "we have here the actual birth of the pointed arch," and it is the more absurd that, in the course of a book one of the special objects of which is to show that design is based on structure, this perfectly unstructural derivation of the pointed arch should be intruded. If Mr. Crane had studied the history of arched construction in mediæval work, he would have known better than to have committed himself to this fallacy. One can hardly be surprised at this, however, when we find evidence that he takes Ruskin as a guide ; one of the most unsafe guides possible in matters of architecture, who knows nothing of construction himself, and substitutes theories and fancies for structural fact. We should say also, that the author seems to underrate the refinement of design in the Doric capital, which he calls "simplicity itself" ; so it is in general appearance, but it is not so simple in design as it appears to the eye. We must take exception also to the insinuation that the Parthenon without its sculpture would be a mere skeleton. Mr. Crane will not find all artists, even those who are not architects, agree with him there ; in fact we have heard the opinion expressed by a very eminent painter that even without any of its sculpture it would be the greatest building in the world, if complete in other respects. Apart from these lapses, the chapter is a good popular statement of the progress of design in relation to architectural structure, with one or two original suggestions in it, as for instance, that the preference for vertical and horizontal lines in late Gothic was an indication of the reaction of taste which was to lead to the Renaissance. We observe that he remarks also on the important decorative use which the Romans made of inscriptions, and the manner in which their dignified square capital letters lent themselves to architectural effect. In regard to the illustrations of this chapter, which are numerous and mostly fairly good, when we see what a charming little sketch is given of the Romanesque tower at Canterbury Cathedral, we do not understand why the tower of the Palazzo Vecchio at Florence should be shown in a sketch which is such an absurd travesty of its actual proportions ; it looks almost like a joke.

In the chapter on "the utility basis" the effect of practical considerations on some of the simpler forms of architecture is very well treated and illustrated. In the importance attached to some forms of handiwork as the *origines* of such a form as the Greek alternating "honeysuckle" ornament we are by no means disposed to concur ; it is ingenious and suggestive, we doubt if it is the real truth. Alternating forms of long and broad ornament have probably another origin, in which the phallic element comes in ; this would naturally be passed over in a popular book, but it is passing over what was unquestionably a most important element in præ-civilised ornament, from which the civilised was derived ; and as to the particular form of detail taken by the Greek honeysuckle ornament, the presence of foliage forms and the desire to conventionally imitate them would be a sufficient stimulus. We are sceptical as to

* "The Bases of Design." By Walter Crane. London : Geo. Bell & Sons. 1898.

the tassel theory, though we admit the interest of the suggestion and the illustrations by which it is accompanied. Nor can we accept the "curled-up shavings" theory for the origin of the volute forms. It seems to be forgotten that early man had latent in him, among other perceptions, that of geometrical facts of line and space, and the spiral would be one of his first discoveries after the circle, and one which would make an admirable decorative plaything. There is no occasion for the "shavings" theory to account for it; merely experimenting in the first facts of geometry, of lines and spaces, would lead to it naturally—more naturally, to our mind, than the other influence suggested.

The latter portion of the "utility" chapter, dealing with the design of practical objects for every day use, such as lamps, candlesticks, &c., is altogether admirable. In the concluding paragraph the author remarks that "nothing has degraded the form of common things so much as a mistaken love of ornament. The production of things of beauty for ordinary use has declined with the gradual separation of artist and craftsman. Decoration, or ornament, we have been too much accustomed to consider as accidental and unrelated addition to an object, not as *an essential expression and organic part of it.*" This, as we have observed over and over again, is the great curse of the trade things made for sale to the general public in this country; bad ornament (so-called) is used to hide and overlay bad construction, the idea of "design" in the true sense of the word never entering into the question at all. The author returns to this point again in the succeeding chapter, "On the Influence of Material and Method," in the excellent remarks on wrought iron work, its capabilities and the manner in which it should be treated. "If we cannot combine a great variety of attractive forms harmoniously, and put them to useful purpose, let us see what we can do with few and simple forms. If we fail at constructing gates of Paradise, let us see if we cannot make a good railing. If we cannot invent a romantic knocker, let us try our hands at an effective scraper. It is much better to do a simple thing well, than a complex or ambitious thing badly; and there is more need in the world for well-designed and beautiful common things than for elaborate exceptional things." In the chapter "On the Influence of Conditions in Design," an important principle is insisted on, which is often forgotten, that in regard to such things as patterns for papers or coverings, the main condition in regard to scale appears to be that we cannot afford to ignore the average human standard.

> "Objects intended for human use or service are bound to be of certain fixed or average sizes—seats and couches about eighteen inches from the ground, for instance; ordinary domestic doors not much over 6 ft. high, and 3 ft. 6 in. or 4 ft. wide. The size of casements, again, is strictly related to the power of the hand to open them; while the sizes of all movable objects of use are in like manner strictly governed by the average size, height, and strength of mankind.
>
> Pursuing the influence of such conditions, we find that there are in every direction natural limitations in every department of design; in the first place of scale and position in regard to the eye and hand, in the second place of method and material."

As a general statement this is excellent, but we regret that on applying it immediately afterwards to the question of the design of book pages, the author repeats Morris's absurd principle that the "unit" of a printed book is the double page as it lies open, and that consequently the inner margins of the pages should be as narrow as possible. This is an utterly wrongheaded notion, which seems to have been taken up in a kind of fashion since Morris enunciated it. The double page would be the unit if we were in the habit of reading every line continuously over both pages; but we do not do so; a book is a collection of pages, and each page is a separate unit. There is a valid reason for making the lower margins large, because there the book is held in the hand, but there is really none for making the outer side margin larger than the inner one; a little larger may be an advantage in appearance, but it is absurd to compress the pages towards the middle opening of the book in the endeavour to treat that as one page which is really two. It is merely one of those "fads" which have been taken up lately, and which are followed as a kind of fashion, with no good reason. There is another point to which we should put a query, in connexion with the subject of wall and ceiling paper designs, which the author seems to treat as if they were on the same grounds, whereas there is a most important difference: the design of a wall paper should have an upward tendency from base to ceiling, it is a rising design; but the essential point in a ceiling paper is that it should be centralised in line, as it has to be considered in all directions. The author shows a ceiling paper design of his own (the upper one on page 123) which is a series of fan-like forms, all growing in the same direction, a kind of design which is manifestly unfit for a ceiling, where the margins are all in the same relation to the centre. The lower one on the page is a true ceiling design; the upper one is not.

In the chapter on "Climatic Influence in Design," in which there is a great deal that is interesting, we rather doubt as to the reason given why highly coloured and varied materials in architecture fall into their place in a sunny climate, and seem staring and unquiet in a duller climate. In the first place, is it the fact; is not a good deal a question of habit? The author is of course perfectly right in remarking, what every one must have noticed, that strong colour in architecture and decoration for the most partly follows the sun; where the sun is brightest and hottest, there will be strongest colouring. But he sets up the theory that "broad and full sunlight has a curiously flattening effect upon colour and pattern, and therefore colours and patterns which under a grey sky would look staring, or very strong and striking, under the full sunlight fall into plane, and become subordinated to the dominant pitch of light." This is a new suggestion, but it strikes us as rather far-fetched, or at all events the wrong way of putting it. Sunlight nourishes and brings out strong colour in Nature; tropical insects and flowers are highly coloured; does it not follow naturally that the sunlight should develop the love of colour in man also? In the matter of dress it is notorious that it does; it is not that people find highly coloured costume look quieter under a hot sun, and therefore they can wear it there though it would be obtrusive in a less sunny climate; the very reverse seems to be the case; the brightly coloured dress looks all the brighter in a hot sun; the brightness of the climate stimulates the love of colour; and it is the same in architecture. Just as people or plants get blanched physically, if deprived of a sufficiency of light, so the taste for colour gets dulled in dull regions, and expands and flourishes under the tropical sun. That we take to be the true philosophy of the subject. Another striking remark of the author's, which we concur in, is that climates which are characterised by constant sunlight and heat favour traditional rather than individual forms of art. If we think of it, we shall see that this is undoubtedly true, and it is a curious fact. We should take it to arise from the greater comfort and indolence with which life is carried on in hot climates; things move more slowly and peacefully, and there is less stimulus to individual exertion, whether of body or mind.

The chapters on Symbolic influence and Graphic influence in design are of much interest. At the commencement of the latter chapter, which deals with the influence on design of various methods of depicting things, the author alludes to the fact that the very early drawings of animals by the cave men seem to have for their object purely the representation of fact, just as a modern artist might make sketches at the Zoological Gardens without any idea of making them parts of a decorative design. "The main difference seems to be that in purely graphic or naturalistic drawing individual characteristics or *differences* are sought for, while in ornamental or decorative drawing typical forms or *correspondences* are sought for." That is so, and that is the reason why there is a certain limit to variety in conventionalised foliage, for instance; we set out by eliminating details which would interfere with decorative breadth of effect, and in so doing we lose some of the characteristic points of the living leaf, till we come to find, perhaps, that two leaf forms which are distinct enough in nature come to very much the same thing when conventionalised for decoration. And that is perhaps the real reason why the conventionalised foliage of one age and nation sometimes presents unexpected resemblances to that of another age; the same process has produced the same or a very similar result in each. Mr. Crane suggests on another page that merely graphic illustration seems to belong specially to very primitive times, the idea of reducing forms to decorative use being the offspring of a more cultivated age; but it is probable that some work which we regard as conventionalised was not at all meant to be so by those who executed it. Mr. Crane cites the Ravenna mosaics as an instance of the suitability of that exceedingly simple and conventional style for mosaic, and gives the well-known figure of the Empress Theodora as an example. We have no doubt that the man who did that meant to give as good and as realistic a likeness of Theodora as he could; the manner in which the ornaments are shown supports that idea. We regard it now as conventionalised, and approve it on that ground; but no such idea was in the mind of the man who designed or made it.

Though, as we have said, a great portion of Mr. Crane's book consists of teaching which is rather true than new, he throws lights of his own on various points, and the presence of the large number of illustrations with which

the remarks are accompanied gives it an artistic interest quite beyond that which attaches to a mere literary treatise.

LONDON GAS: ITS SUPPLY AND QUALITY.

COMPARATIVELY few consumers of London gas are aware of the stringent manner in which the gas supplied by the London gas companies is daily tested on behalf of the general public by official examiners appointed by the London County Council and the Corporation of London. There are twenty different testing stations in various parts of the area under the jurisdiction of the London County Council and three within the City boundaries, and at each of these stations the gas is tested daily (Sundays excepted), and the gas examiner is at liberty to perform his tests at any hour of the day or night, without giving previous notice to the gas company. The methods by which the gas must be tested and the degree of purity it must possess are determined by a trio of eminent scientific men known as the "Gas Referees." These Gas Referees issue printed instructions from time to time prescribing the manner in which the gas examiners shall test the gas to ascertain its lighting power, purity, and pressure.

Pressure.—The value of the gas supplied by the companies to the consumer depends very largely upon the amount of gas-pressure he can obtain at the point of ignition, for upon the maintenance of a steady and efficient pressure depends the utility of the incandescent burner, the gas-fire, cooking-stove, and large number of other gas appliances now in general use amongst consumers of all classes. In the early days of gas manufacture, when gas was used for little else save for lighting by means of primitive flat-flame burners, and when the percentage loss of gas by leakage in the mains was more serious than at the present time, the gas-pressure prescribed by Act of Parliament of a minimum of $\frac{6}{10}$ths in. between midnight and sunset, and 1 in. between sunset and midnight was, no doubt, considered sufficient to meet the requirements of that period; but while strenuous efforts have been made from time to time to force the companies to supply gas of a higher illuminating power, little or nothing has been done to obtain the supply of a greater and more uniform pressure. This is probably partly due to the fact that the gas is usually supplied at a pressure much greater than is required by Act of Parliament; but the Act does not enforce a sufficiently high pressure, and what is more important, a sufficiently *uniform* pressure to meet the requirements of present day consumers. It is, of course, possible to employ pressure governors, but in practice pressure governors are very apt to get out of order, and many of those in use at the present time are by no means satisfactory, even when in so-called working order. Moreover, it would surely be better to have gas supplied from a central station at a pressure of such uniformity that a governor would not be necessary, than, as at present, to have the pressure liable to such variations that every consumer who wishes to obtain the most satisfactory and economical results from his gas supply must obtain one or more governors to do so. "Every man his own governor" is not the motto to be adopted in this case, however well it may sound to men of a socialistic turn of mind. Again, the statutory pressure of $\frac{6}{10}$ths in. between midnight and sunset is absolutely insufficient to give anything approaching to a satisfactory result with the incandescent mantles and many of the gas stoves now so largely used. These standards of pressure were fixed in the days when consumers used little gas beyond what was burned in the evening through flat-flame burners for lighting purposes. But now the average winter consumption of gas in London, and especially within the City of London, between the hours of midnight and sunset is enormous; for the use of gas for restaurant cooking stoves, for gas engines, gas fires, and other appliances used during the day has become so general, that the public can no longer be regarded as night consumers only, and, furthermore, in a city so subject to fogs as London it would be absurd to alter the pressure at sunset—an occurrence which sometimes takes place before even the most observant citizen has been able to obtain evidence of a sunrise. Even if the gas were supplied during the whole day with the present statutory requirement between sunset and midnight of a pressure sufficient to support a one inch column of water, the pressure would not fully meet present day requirements. As a matter of fact, the gas pressure at the street main usually varies during the year, and frequently during the day, from about 1·2 in. to about 3·0 in., and such a pressure being found necessary in practice, the question arises, "Why should the gas companies have a legal right to supply all gas manufactured by them at a pressure below that necessary to meet the common requirements of consumers."

If the standard pressure were fixed at a minimum of $1\frac{1}{2}$ in. and a maximum of $2\frac{1}{2}$ in., consumers would less frequently have to complain of an insufficient supply of gas, which, as will presently be demonstrated, is ascribed by the average consumer, to the supply of "bad" gas. At present, it is practically impossible to manufacture an incandescent mantle which will yield a constant illuminating power with the gas varying from 1 in. to 3 in. and if a more uniform pressure could be relied upon, there would be less difficulty in manufacturing burners and stoves which would emit the same amount of light or heat at all times of the day and night.

Another annoyance arising from large fluctuations of pressure frequently occurs to consumers who have gas jets in their bedrooms, which they are in the habit of allowing to burn all night at as low a consumption as possible. If the pressure is high when the consumer turns down the jet, the flame is liable to become extinguished altogether when the pressure falls, and a small quantity of unburnt gas passes undetected into the room until the sleeper awakes. A similar nuisance sometimes occurs in greenhouses lighted by gas-stoves. The gas cock is often turned down until the jets are as low as possible, then during the night the pressure drops, and the result is that some of the atmospheric burners "light back," and produce that well-known but most horrible odour arising from the products of the incomplete combustion of gas.

Before leaving the subject of gas-pressure it may be well to refer to a matter which is often made a source of complaint against the company, but in reality is as much the fault of the consumer as of the company. In the winter time the pressure found at the consumer's gas-bracket often falls very low, and consequently the light obtained is very poor; this may be caused through the pipe connecting the consumer's premises with the street main being too small to allow the amount of gas he requires to pass when the pressure in the street main is not greatly above that required by Act of Parliament, or it may be caused by the fittings within the premises being too small. It is a common matter to find a number of gas-stoves burning, say, 30 cubic feet per hour, placed in a house having fittings originally provided for, say, a dozen flat-flame burners consuming 5 ft. or 6 ft. an hour, these burners being still in use, in addition to the gas fires and stoves. The natural consequence is that a sufficient supply of gas cannot be obtained, and the company is blamed for supplying wretched gas.

Another very frequent trouble, especially in cold weather, is the partial choking of the service-pipes leading from the street to the consumer's premises. The low temperature sometimes causes certain substances of a tarry-like nature to become deposited in the pipe, and the pipe gradually becomes more or less choked; the result is similar to that obtained with a service-pipe of insufficient diameter, and once again the company is anathematised for supplying "bad" gas, although the fault lies with the weather, and a polite note to the company would probably cause them to send their men to blow out the service and put the matter right within twenty-four hours, free of charge.

Lighting Power.—The illuminating power of gas supplied by the London gas companies must be such that when burnt at the rate of five cubic feet per hour through a standard London argand burner, and tested in accordance with the instructions issued by the gas referees, it will give an illuminating power of not less than sixteen standard candles, and it is seldom that the gas falls appreciably below this standard when tested at the official testing stations. But although the gas, as tested at the testing station, is usually above the sixteen candle standard, it must be borne in mind (1) that the testing stations in cold weather are kept constantly heated by artificial means, the temperature seldom being allowed to fall below 60 deg. Fahr., and often rising higher than this, and (2) that the volume of gas used for testing is corrected to a standard temperature of 60 deg. Fahr., and a standard pressure of 30 in. It has been shown by Mr. H. Leicester Greville that the water in a wet meter (wet meters are always used at the testing stations) absorbs a considerable proportion of the light-giving constituents of the gas at a low temperature, and gives them off again as the temperature rises. Now, if gas has been slowly passing through the testing-meter for twenty-four hours, at a certain temperature, and when the examiner arrives to test the gas the temperature of the water in the meter is raised through his lighting gas-burners in the room, or through other causes, the luminosity of the gas tested is likely to be increased by the evolution of hydrocarbons previously absorbed. Moreover, apart from this matter, it is possible that the mere difference in temperature between the gas used by the consumer in

severe weather, and that which has passed through the testing meter, may have some influence upon its luminosity. However this may be, it is certain that when the gas is tested in the ordinary manner, save that the testing station, and consequently the testing-meter, is liable to all the changes of atmospheric temperature, the gas frequently does not give such high illuminating power as is found at the official stations.

With regard to the effect of correcting the volume of gas to a standard temperature and pressure, it is, of course, impracticable to correct consumer's consumption in this way, but the consumer may find it convenient to remember that gas expands when warmed and contracts when cooled, and consequently he can obtain more light and heat from 1,000 cubic feet of gas measured at say, 50° F., than from the same volume of gas measured at say, 68° F. Or to demonstrate it another way, 1,000 cubic feet measured at 50° F., would be registered as about 1,035 cubic feet if the gas were measured at 68° F., assuming that the barometric pressure remained constant. This fact may be made use of when determining the situation of the meter, but it is not advisable to expose the meter to severe cold. So far as gas testing is concerned, it is but reasonable, in view of the effect of temperature upon the volume of the gas and upon the absorption properties of the water in the testing meter, to test the gas at as constant a temperature as practicable, otherwise the company would be obliged to regulate the illuminating power of their gas to the atmospheric temperature likely to obtain at the time and place at which the gas is tested, which would be absurd.

The supposition that the complaints as to "bad" gas are in reality due, as a rule, to insufficient quantity and not to insufficient quality, is confirmed by the recommendation by several men of repute that the present 16-candle standard be lowered to a 14 or 14½-candle standard. The arguments put forward are that 16-candle gas, as most commonly used by consumers, does not give an appreciably greater amount of light than 14-candle gas, and that it would be cheaper for consumers to use the gas obtained from the coal *per se*, which has an illuminating power of 14 to 14½ candles, than to pay the extra cost of enriching this coal-gas by means of oil, cannel coal, or carburetted water gas, to 16-candle power, as is at present done. Having regard to the large use of gas for heating purposes, the question must be largely dependent upon the respective calorific value of the enriched and unenriched gas.

Purity.—By Act of Parliament the gas must never contain sulphuretted hydrogen, and by the Referee's instructions it must not at the present time contain more than 22 grains of sulphur, nor more than 4 grains of ammonia per 100 c. ft. of gas.

As a rule the sulphur and ammonia are well within these limits, and sulphuretted hydrogen is not present. In the event of a deficiency in illuminating power, purity, or pressure being reported by any of the gas examiners, the company usually appeal to the Chief Gas Examiner, who is an impartial person appointed by the Board of Trade, and whose decision, when appealed to, is final. The company are required to pay a penalty for every failure to comply with the requirements of the various Acts of Parliament, unless the Chief Gas Examiner decides that the Gas Examiner did not follow the referee's instructions when making his examination of the gas, or that the deficiency was occasioned by some unavoidable cause or accident, in which case no forfeiture is incurred.

NOTES.

St. Bartholomew's Priory and the Cripplegate Fire.

IT is stated that the inhabitants of Cripplegate Ward have formulated a scheme for widening Jewin-street, and driving a new road (through St. Botolph Without and St. Bartholomew-the-Great parishes) to West Smithfield, as a precaution against another great fire. If their present proposal is carried out it will involve, we understand, the demolition of the fine gateway, of transitorial date, forming one entrance into Bartholomew Close, and partially imbedded in two houses at the south-east corner of the market area. It has been said that the gateway was a west door into the Priory church, but that can hardly be the case. There can be little doubt that it was an entrance, or posterngate, into the close and cloisters on the south side of the church. For, whilst it is in a direct line with the south aisle of the nave, it stands too far from the nave, which extended about 100 ft. from the present west wall of the church; moreover, it is too high and too large for a doorway at the end of an aisle. As to the proposed street, the line of a road from opposite the west end of Jewin-street to the corner of West Smithfield would pass through Queen-square and the two inner blocks of Bartholomew Close. Thus it would pass over the sites, from east to west, of the Priory Lesser Close and the Prior's stables, the Mulberry Gardens (now traversed by Middlesex-passage), the Dormitory (City of London Union Offices), the Refectory (conjectured position), and the Cloisters as plotted in a plan of the Priory buildings which we published on May 8, 1886, and believe to be correct in its main lines. On that plan, it may be observed, the gate in question is 60 ft. distant from the west end of the nave. The nave site is now the western churchyard, being "the void ground 87 ft. in length and 60 in breadth, next adjoining to the west side of the church, to be taken for a churchyard," specified in a deed of sale by which, on May 19 1544, the King sells for 1,064*l.* 11s. 3d. to Sir Richard Rich all the Priory buildings within the close, but reserves "the church within the Great Close to be a parish church for ever." The gate is no part of the church, therefore, but that does not alter its architectural and historical value. We do not imagine that its destruction, to secure an arbitrarily-chosen line of street, will be permitted.

Children's Sight.

MR. BRUDENELL CARTER, the well-known oculist, delivered a lecture at the Society of Arts last week on the subject of children's sight, based to some extent on interesting investigations which he had made in regard to the sight of children in the elementary schools in London. We are not now about to discuss the great proportion of those who have imperfect sight, but we desire to emphasise what Mr. Carter says in regard to the effect of children's surroundings on eyesight. We have more than once pointed out that in the great public schools sufficient attention is not paid to the lighting of class-rooms; they are badly lighted in many respects, doing permanent harm to the pupils' sight. Fortunately in the elementary schools most of the work is done by daylight, but there can be no question that every elementary school should be as perfectly lighted as possible. In their homes children frequently read under still worse conditions, and there are hundreds of girls in London houses who pursue their studies in the worst light in the house. Unfortunately ground space in London is now so valuable that the insides of London houses tend to grow darker, and so more injurious to the sight.

Proposed Canal between the Seine and Marne.

THE intended demolition of the Paris fortifications between the Seine and the Porte de Pantin revives attention to a scheme proposed, some twenty years ago, by an engineer, for the formation of a canal fed by the river Marne, between Neuilly-Plaisance, on the north-east of Paris, and Epinay-sur-Seine, on the north-west. The scheme would have the double advantage of preventing the inundations of the Seine and Marne, which cause every year a great deal of damage to river-side property, and of forming to the eastward of Paris (the side most menaced in case of war) a kind of natural fortification of much more practical value than the existing wall.

A Berlin Competition.

THE result of a competition for designs for an elevated electric railway in Berlin has been announced. Messrs. Möhring, of Berlin, Schumacher, of Friedenau, and Schellewald, of Schöneberg, have taken the first prize for their design for the station in Potsdamerstrasse. Curiously enough, the same gentlemen have been awarded the second prize for their design for the viaduct in Bülowstrasse, while Messrs. Bernhard & Stahn have obtained the third prize for their design for the same viaduct. Not having seen the conditions, it is difficult for us to understand what principles the assessors followed in thus awarding prizes for portions of the work; the system does not seem wholly satisfactory. It is, however, pleasant to note that the authors of the seven unsuccessful designs receive fair treatment. On application in the proper quarter they will obtain, not only their own drawings, but also copies of the assessors' reports and fac-similes of the successful designs. The last item is especially worthy of imitation in this country.

Primitive Ireland.

ON the 24th ult., Mr. W. Law Bros lectured at the London Institution on the subject of "Primitive Ireland." The lecturer interpreted the adjective in the most catholic sense. Limelight views were shown on the screen of modern peasants and their dwellings; of the lovely sculptured cross at Kells (which is hardly "primitive"); of the oratory at Gallerus and others of its type; of the Clare Island castle, said to have belonged to the Connaught queen whom people will insist on calling "Grace O'Malley" (it is a pity Mr. Bros did not show the very remarkable little church on the same island); of the forts on the Aran Islands, which, owing to their stupendous size and the complete mystery that surrounds their origin, are the most impressive works of man remaining in the British Islands — notwithstanding the

atrocious treatment they have received at the hands of restorers; and of many other buildings. A large audience, to most of whom the subject was obviously entirely new, followed the lecturer with interest.

Polyphase Transmission of Power.

ALTHOUGH polyphase transmission of power has been for several years in successful operation abroad yet it is only now beginning to be adopted in England. The two papers read before the Institution of Civil Engineers last week both treated of this important subject. The first paper was by Mr. Llewelyn B. Atkinson and gave a *résumé* of the theory, design, and working of alternating current motors. His division of the many types of polyphase motors into various classes was good and will be helpful to engineers by reminding them of the different principles on which apparently similar machines work. Numerous starting devices were also described, and the numerous diagrams shown were a great help in understanding their action. Useful curves were given showing the relative weights of continuous-current, single phase, two phase, and three phase motors. As three phase motors are simpler in design and mechanically stronger than continuous current motors, there is a large field for them in factories in this country. Messrs. Ganz & Co. have shown some of their motors working under water. The other paper was by Mr. H. F. Parshall, and was on the Dublin Electric Tramway. As the large three phase transmission plant for this tramway was the first in this country, Mr. Parshall is to be congratulated on its success. His paper was interesting from a commercial point of view, as it shows how traffic can be developed by an improved service. The traffic on this line was formerly worked by three unprofitable horse lines which were finally sold for about 14,000*l.* The value of the present property, although it has not a through connexion to the centre of Dublin, is 300,000*l.*, and its revenues are consistent with this sum.

Sanitary State of King's Lynn.

IN Dr. F. St. George Mivart's Report to the Local Government Board on an outbreak of enteric fever at King's Lynn, the outbreak is attributed to the faulty character of the public water service, which appears to be of the worst possible description, although other sanitary (or insanitary) conditions in the town are bad enough. The head-waters of the stream from which Lynn gets its supply are derived from springs that flow out of the base of the chalk, the water in which formation is held up by the underlying impermeable Gault. The water of these springs is in itself of satisfactory quality, but it is unfortunately polluted at or near to its sources. Two of the three principal sets of springs rise amidst foul surroundings. The northern set at Grimstone rise directly from beneath the churchyard; another set rise upon and around the slope whereon stands the farmstead known as Well Hall, where the springs seem to be looked on as the fit receptacle for all the filth of the farmyard. One building is directly over a spring, the water of which may be seen oozing out from under the outer wall. As if these sources of pollution were insufficient, Dr. Mivart found an immense heap of refuse and farm manure close to the edge of the stream. "The inhabitants of two cottages, situated just below this point, obtain water by 'dipping' from the stream, and the enormous quantity of mussel shells thrown upon the very edge of the stream immediately adjacent to this 'dipping' place is significent of the indifference of the population of the district to the purity of their water supply." It appears that local medical opinion long since utterly condemned the water, yet a large and influential section of the inhabitants of Lynn maintain, or at any rate have maintained until now, that this water, manifestly polluted though it be, is of excellent quality; a statement which can only be made, one must conclude, for reasons connected with local politics.

200-volt Lamps.

THE paper read by Mr. Byng to the Institution of Electrical Engineers last week on the manufacture of lamps and other apparatus for 200-volt circuits is very interesting reading for those consumers who have the misfortune to be supplied with electricity at 200 volts. Mr. Byng, as a manufacturer, gives a fair statement of the case, and it may well give pause for reflection to the many consulting engineers who have advised corporations to adopt this pressure. The results of a series of life and efficiency tests made by Mr. Robertson show that the ordinary high voltage lamps, with unflashed filaments, after 600 hours' use, only give 40 per cent. of their rated candle power, and their efficiency has diminished 35 per cent. This drop in the efficiency gives some of the lamps a long life, as the temperature of the filament is too low. This may explain how they are sometimes said to give satisfaction, as some consumers are satisfied with a long-life lamp, and pay little heed to its efficiency. Another drawback to high voltage lamps is that 10 per cent. of them short circuit as soon as they are put up. This difficulty, Mr. Byng pointed out, could be got over by making the holders for the lamps larger, but this would detract from their appearance. He dwelt upon the dangers of using cut-outs with china bases on 200-volt circuits, as the china base is easily volatilised and not only contributes towards the maintenance of the arc, but is sometimes ruptured explosively, and may set fire to inflammable surroundings. An excellent cut-out was shown that obviated this difficulty. It is, however, more expensive than the ordinary ones. Mr. Byng concluded by pointing out that 200-volt lamps must necessarily always be more expensive than 100-volt lamps. In the subsequent discussion none of the statements in the paper were seriously questioned. Mr. Raworth, speaking as a consumer, stated that Mr. Byng had greatly underrated the case against a 200-volt supply.

Carpenters' Hall Lectures.

THE second of this series of lectures was given on Monday evening by Professor T. Roger Smith, who took for his subject, "Some Notable Buildings in France." The chairman, Dr. A. Robertson, of King's College, in his introductory remarks, stated that "the French had always been the pioneers of Gothic architecture," but the lecturer himself, in describing and criticising the French buildings of the mediæval period, did not appear inclined to endorse the view, now so often put forward, of the innate superiority of French over English Gothic work. Many excellent lantern illustrations were shown in the course of the lecture, arranged in geographical sequence, taking the form of a tour through the principal cities of France. A wide area, in point of time, was covered by these views, as they ranged from the Roman aqueduct called the Pont du Gard, down to the new Opera House at Paris; the majority, however, referred to the great cathedrals of the Middle Ages. The lecturer attributed the more grandiose and richer character of so many of the cathedrals of France, compared with those of this country, to the greater wealth available in the former country at the time when they were being built; but he considered that the best English examples excelled the French buildings in having a finer skyline and a more dignified effect, the latter characteristic being more especially remarkable when contrasting specimens of the late Gothic work of the two countries. In showing some views of Mont St. Michel, he alluded to Mr. Pennell's account of "the most picturesque place in the world," and claimed for Mont St. Michel that it really had a better right to the title. Attention was also drawn to military, domestic, and civic architecture, some characteristic examples of each being shown on the screen, including the restored castle of Pierrefonds, the palace of the Tuileries and the old Hôtel de Ville of Paris, both destroyed by the Communists, as well as the new Hôtel de Ville, built to replace the latter, which the lecturer considered to be inferior, in external aspect, to its predecessor. A large audience followed the lecture with evident interest and attentiveness. Next Monday Mr. Lewis F. Day will lecture on "Wood Carving—its Design and Practice."

All-Hallows on the Wall.

THIS church has just been reopened, after undergoing a thorough renovation by Sir A. W. Blomfield, at a cost of about 1,700*l.* The church was built in 1765-7 from the designs of George Dance, the younger, its predecessor having fallen into a ruinous condition. Of the former church there is a view by W. H. Toms and R. West (1740), reproduced in our issue of April 25, 1885. Toms's description of the church, which we printed at the same time, is taken from Hatton's "New View," 1708. The church adjoins the old city wall, and the vestry, it is said, was built on a bastion. The portion of the wall eastwards from the church forms a garden wall to some houses in New Broad-street; another piece, about 150 ft. long, was found, close to the church, in 1885, during the construction of Blomfield House, at the corner of Blomfield-street (formerly Broker's-row) on the site of the old Portuguese synagogue. The upper course of the wall, of ragstone, 2 ft. 6 in. deep, lay nearly level with the then existing ground. All-Hallows churchyard was laid out in the spring of 1895 by the Metropolitan Public Gardens Association as a public recreation ground.

Dudley Gallery Exhibition.

THE water-colour exhibition of the Dudley Gallery Art Society contains a splendid example of an architectural water-colour, Signor Giampietri's "Stylobate of the Temple of Antoninus and Faustina" (42); he sends also "The Sauvetorilia Forum, Rome" (78). Another capital architectural subject, a mere

sketch but thoroughly artistic, is Miss Margaret Bernard's "Houses of Parliament" (132). The same artist contributes what is certainly the finest drawing in the room, the broadly-handled scene entitled "Haymaking, Woodleaze, Dorset" (140). Among the more highly-finished drawings that are worth attention are Mr. Geo. Marks's "Haytime" (243) and "A Surrey Landscape" (255), and Mr. Newton Benett's "Warborough" (267) and "The Cathedral Green, Wells" (273).

Miss Greenaway's Exhibition.

THE exhibition of drawings by Miss Kate Greenaway, at the Society of Fine Arts, seems to indicate that this lady's real power lies in the little figures of children with which she has decorated so many books, coloured in a flat and half conventional style. The larger water-colours and drawings in the collection are not of the best order as examples of water-colour, and many of the figures are very defective in drawing; in the larger sketches of figures walking, in fact, the knee seems to come anywhere, higher or lower, as if by chance. Look at "Come Along," for instance (114), and some others. The best of the larger drawings is "Two at a Stile" (27), which has good decorative lines and is a very charming invention in every way. Among the little child figures for which the artist is famous are some in her very best style, such as Nos. 1, 4 and 6, the latter a group of dancing children lent by Mr. Ruskin, which is perfectly charming. But Miss Greenaway's success lies within this field, and she will be wise to restrict herself to it.

Russian Artists in Paris.

SOME young Russian artists living in Paris have combined together to form an exhibition of their work, which is of some interest. Among the paintings is a fine portrait by M. Alexandrovitch, sea pieces and landscapes by M. Belacwsky and M. Chabanian, studies by MM. Loewe, Magkoff, and Tkatcheuko, and a painting by M. Louchnikoff—"Le Soir." Of the sculptures the statuettes and busts by MM. Bernstamm and Aronson are among the most noticeable.

Westminster Abbey.

WE are officially informed that Mr. J. T. Micklethwaite has been appointed architect to Westminster Abbey, in place of the late Mr. Pearson.

THE FLORENTINE RENAISSANCE.*

BY PROFESSOR AITCHISON, R.A.

As we owe the discovery of the methods of building used by the Romans and Byzantines to M. Auguste Choisy, so do we owe to Baron Henry de Geymüller the right attribution to their authors of many of the buildings of the Renaissance. Baron de Geymüller has the gift of tongues, and writes equally well in German, French, Italian, and English. With indefatigable industry he has visited every known work of Bramante, and looked through the sketches of most of the Renaissance architects in the various libraries of Europe, and by comparing the handwriting as well as the character of the design, he has restored to their authors the credit for many buildings attributed to others. Fra Giocondo (born 1433, died 1515), the learned ecclesiastic who edited two editions of Vitruvius and gave us the first illustrated one in 1511, as well as his "Corpus Inscriptionum," dedicated to Lorenzo du Medici, and eventually incorporated in the works of Maffei, Gori, and Muratori, was well known for his learning and scholarship, as well as for his studies of ancient Roman work and for his great abilities as an engineer. He was employed by the Emperor Maximilian at Verona, 1494-8, was sent for by Louis XII. of France to build bridges over the Seine, and he executed still more important engineering works for the Republic of Venice. From the difficulty of persons in the present day conceiving the possibility of that general capacity for all sorts of skill, knowledge, and invention, that so distinguished the artists of the Renaissance, it has been the fashion to deprive Fra Giocondo of all credit as an æsthetic architect; but Baron de Geymüller, by going through the drawings preserved in the various libraries of Europe, has been able to affirm the capacity of Fra Giocondo as an æsthetic architect, and, in spite of the adverse criticism of the late Léon Palustre, has shown that in all probability he was the architect of the Palazzo del Consiglio at Verona (see lithograph). This most charming and delightful palace has been the delight of all architects visiting Verona. The late Dr. Middleton discovered in the walls of Verona the remains of a doublet window erected in the days of Gallienus (reign 260 to 268 A.D.), from which Fra Giocondo took his windows for the Palazzo del Consiglio. In the present day the simple appropriation of some anterior design would not be considered conducive to the credit of an architect, but when the desire of the public and the architects was to re-create Roman architecture, the use of a piece of Roman work was highly conducive to their fame. Vasari tells us how Giuliano da San Gallo repeated a peculiar Roman Ionic capital in the new buildings he was then erecting for the monks, that was dug up in the gardens of the monastery, and also attributed great merit to Baldassare Peruzzi for adapting a Roman cornice he found, to a palace that he was then erecting. We, however, are merely concerned with the beauty of the new constructions, and are perfectly indifferent as to whether the striking features were taken from Roman work or were the outcome of the architect's inspiration.

The Palazzo del Consiglio at Verona looks as if it had been erected in two pieces; at any rate, in the middle of it there is a pilaster that goes right up the building, dividing it into two halves. These two halves of the palace are precisely similar, and consist, on the ground floor, of three columns on each side of the central pilaster. These columns stand on pedestals, between which there are balustrades, and support a very light and elegant arcade, which in its turn supports a narrow entablature; above this entablature is a low continuous podium. In the middle of each of these halves on the first floor there is a pilaster, and in the centre of each space between the pilasters is a window, consisting of a doublet supported on columns, with semicircular arches, and surrounded by dressings, consisting of pilasters supporting an entablature with a segmental pediment above them. Above the crowning member of the top cornice of the building, and over each pilaster, are pedestals supporting statues. I believe the panels of the first floor, between the windows and the pilasters, are painted, and are either altogether modern, or restorations of the remains that could be traced of ancient painted panels. The two upper pilasters between the central and angle ones are supported on ornamental corbels, after the fashion of capitals, coming down into the spandrels of the arches, while lower in each spandrel is a small shield. This portico on the ground floor is entered by two short flights of steps between the first and second column to the right and left of the central pilaster, and the height of the steps is made up by a sort of continuous base below the pedestals of the columns and pilasters. The panels of all the pilasters are carved with arabesques, and in the alternate segmental pediments are mermaids supporting a shield, and lions or chimeras, also supporting a shield between them. The whole building is extremely light, and of most graceful proportions, and the solidity of the first floor forcibly contrasts with the eight large openings below. On the left hand angle pedestal of the first floor there is a bas-relief of a friar, who has in his hand Pliny's Epistles, some of which Fra Giocondo discovered in Paris. That bas-relief, therefore, confirms the belief that he was the architect. Fra Giocondo was one of the architects of St. Peter's after the death of Bramante.

Raphael became the great friend of Bramante, as they both were from Urbino. It was through Bramante's influence that he was induced to come to Rome and was introduced to the Pope; it was from Bramante that he learned the elements of construction, for his early works show that he was well acquainted with architectural forms and with perspective, and it was at Bramante's intercession with the Pope that he was appointed head architect to St. Peter's after Bramante's death.

The principal architectural works of Raphael (1483-1520) as an architect, before he became the head architect at St. Peter's, are the church of St. Eligio of the Goldsmiths at Rome, the Palazzo Pandolfini at Florence, and the Palazzo Farnese at Rome. This last is commonly attributed to Baldassare Peruzzi, but there seem excellent reasons for believing that Peruzzi had not begun to study architecture when this palace was built, although Vasari attributes the design to him. But the marvel is that Raphael should have so mastered construction as to be recommended by Bramante to succeed him, for from his age it was only reasonable to suppose he would live to complete the dome.

I give a view of Raphael's Palace, said to be designed by Bramante (see lithograph).

Baldassare Peruzzi (1481-1536), like Raphael, was ultimately a disciple of Bramante. That he was a man of very extraordinary powers there can be no doubt; that he was a distinguished painter no one can deny. We have a picture by him in the National Gallery, but whether he was so great an architect as has of late been asserted is doubtful. He is entitled to great credit, not only for the admirable planning of the two Massimi Palaces at Rome, but for making a successful façade to the great one, which was in the Via de San Pantaleone, which is curved (see lithograph); but though the front and its parts are well proportioned, and the mouldings and treatment are delicate, I should hardly class it with the Basilica at Vicenza, the Communal Palace at Brescia, the Library of St. Mark's, or the Farnese Palace. His principal merit there was that he did not use columns or pilasters on his front, but used columns only where they were wanted. If we may judge from his works he seems to have thought that this pilastering and columning of fronts was not a very sensible procedure, and to have left out columns and pilasters in the bulk of his works; and that is all the more reason why we may believe that the pilastered fronts of the Farnesina is Raphael's and not Peruzzi's. At the Massimi Palace he only used columns to support the entablature of the open porch.

The Palazzo Albergati at Bologna has no pilasters or columns on its front; perhaps the most charming front for simplicity is the front of his Casa Pollini at Siena, with its battered basement wall, its row of seven corniced windows to the Piano Nobile with the great blank spaces below and above them, and with seven square windows in the attic, and widely projecting eaves. That this was a matter of judgment or taste is undoubted, for his design for the organ case at Siena is a most elaborate composition. When Mr. Hill published his book of organ fronts he was rather disgusted with me for saying that Peruzzi's organ case was worth all the rest in the book.

Great credit has been claimed for Peruzzi for showing Sansovino the way to make attic windows in the frieze of the crowning entablature, but I think he might have well been spared that particular commendation. Sebastian Serlio has produced Peruzzi's plan for St. Peter's in his book ("Venice, 1544," Book 3, page 38), though Baron de Geymüller says that it was but a copy of a sketch by Bramante. I hope to give you an account of St. Peter's next year. I give the Palazzo Ossoli attributed to Peruzzi (see lithograph), which has pilasters on the two upper floors, and, in my opinion, does not add to his fame.

Peruzzi was one of the unlucky men; he was taken by some of the Constable Bourbon's soldiers, after the sack of Rome, 1527, and from his dignified mien was supposed to be a great ecclesiastic, and was tortured to get a large ransom from him; when they found he was only a painter, they made him paint Bourbon's portrait, and I suppose let him escape; on the road to Siena he was robbed, and had to enter the town in his shirt. He made, too, the mistake of fancying that, because he was learned and skilful, his merits would be appreciated,

* Being the fifth Royal Academy lecture on Architecture this Session. Delivered on Monday afternoon, February 14.

and so died very poor, but his merits were at last appreciated after his death, for he was interred in the Pantheon, where Raphael was also buried.

I have not attempted in these lectures to give a sketch of the work of each architect of the Renaissance, but as a rule only to speak of those buildings that have struck me as being peculiarly beautiful, or as having such strong character that they greatly impressed one in looking at them, and some slight sketch of the architect, and even this is, I fear, a little too much; but I shall continue this method to the end, perhaps adding a few who, from their celebrity in other ways are important to be considered when they took upon themselves the duties of architects. There are two of the great architects who have left works that have arrested our attention either by the grandeur and dignity of their buildings or by the particular charm of their designs. The one was Antonio Piccone, called Antonio da San Gallo, because he was sent for by his uncle Giuliano to Rome and became his pupil. To him we owe the great Farnese Palace. Curiously enough John Addington Symonds left his name out in his list of architects, probably mistaking him for his uncle, the elder Antonio. The other great architect was Jacopo Tatti, called Sansovino, who built the great library in the Piazzetta at Venice.

Bramante, Raphael, Giuliano da San Gallo, and Michelangelo were all architects in chief to St. Peter's, while Fra Giocondo, Peruzzi, and Antonio da San Gallo the younger were assistant architects. The subsequent architects to St. Peter's, and possibly some less well-known men who were employed there, I shall postpone until I am able to give some account of the building of St. Peter's, for although we may not consider it very important as a work of art, it is not only the great Roman Catholic cathedral of modern times, but is also one of the largest buildings in the world. Size and bulk are always important features in architecture even as a visual fine art, but the difficulties of enormous buildings from a constructive point of view are tremendous, so that the architect always deserves great praise, even if his building be not very charming to look at, if it stand.

Michelangelo, Palladio, and Longhena I shall speak about in my last lecture.

Antonio da San Gallo the younger had the advantage of acting as draughtsman to Bramante when, from gout and palsy, he could no longer draw, and as Bramante found him to be a most invaluable assistant, he probably hid none of his knowledge from Antonio. In my next lecture I shall give an account of the Farnese Palace.

Jacopo Tatti, 1477-1570, was called Sansovino because he was a pupil of Andrea Contucci da Monte Sansovino, called so from his native place, and took the nickname of his master instead of his own family name. He became, thanks to the care bestowed on him by Andrea, and his friendship with Andrea del Sarto, a very distinguished sculptor. He was taken to Rome by Giuliano da San Gallo, who was then architect to Pope Julius II., and here he became acquainted with Bramante, and admired some of his designs. Pietro Perugino, who was painting a ceiling for Pope Julius, having remarked the talent of Sansovino, got him to prepare wax models for his use, and possibly through him Jacopo Tatti became acquainted with the great artists of the time — Luca Signorelli, Pinturicchio, and Cesare Cesariano; but becoming ill from overwork he had to leave Rome and go to Florence, where he soon got cured, and became celebrated at Florence for the draperies of his sculpture. Leo X. on visiting Florence was much struck with some of Sansovino's sculpture in the temporary decorations prepared for his triumphal entry, and gave him an order to do some in marble, and sent him to Pietrasanta to get the marble, but from the delay in the carriage the Pope had left Florence before his return. Jacopo followed him, but found that Michelangelo had got all the sculpture to do for him, and Sansovino may be said to have been thrown on private practice, and here he began to study architecture, and he was chosen by the Florentines in Rome to be the architect to their church, dedicated to St. John the Baptist. Meeting with an accident at the church he went back to Florence, leaving the care of the foundations of the church to Antonio da San Gallo. In 1527, the sack of Rome by the Constable Bourbon took place, and Sansovino took refuge in Venice. The cupolas of St. Mark's required repair, and Sansovino having repaired them to the satisfaction of the Doge, the Senate, convinced of his ability, made Jacopo protomaster of the procurators of St. Mark's, the highest office conferred by the Signory on its architects and engineers. He seems to have shown as much ability in keeping their accounts and managing the laying out of their property in Venice, as he had done in sculpture; in fact, he is said to have increased their revenues by 2,000 ducats a year. He got from them an order to build the new Library, which is said to have caused a notable change in the mode of building at Venice. The vaulting of this Library having tumbled down, Jacopo was imprisoned and fined a thousand ducats; but the Signory, finding that it was not his fault, let him out of prison, and returned him 900 of the ducats he had paid. He subsequently built a great many palaces, and put the celebrated loggia round the bottom of the Campanile, and executed the two colossal figures of Neptune and Mars at the top of the staircase into the Ducal Palace, which from them is called the Giant's Staircase. Sansovino died at the age of 93 in Venice, admired and respected, and in the full possession of all his faculties, not even it is said requiring spectacles.

The great Library of St. Mark's is well known, and has been admired by every visitor to Venice. It consists of two stories of columns, Doric on the ground floor and Ionic on the first floor, with arcades between them with figures in the spandrels, and an attic whose windows are introduced into the deep frieze. It is a most charming and seductive building, very much in the style of Palladio's Basilica at Vicenza, and though much more graceful and ornate, misses the classic severity and imposing grandeur of Palladio's work.

Sansovino also, as already observed, built the Loggietta at the foot of the great Campanile in the Piazza. A few steps up from the Piazza take you to an elaborate bronze gate, on either side of which is the balustrade which protects persons walking on the terrace. The front consists of three arches, forming entrances to the rooms within. It has Composite columns on either side of the doorways, leaving space for a niche between each pair (see lithograph). Above the entablature is a blank attic with narrow piers above the columns. Between each pair of piers is a bas-relief. The bas-relief and the statues in the niches, especially the Mercury, have been very much admired. The whole of the Loggietia is crowned by another balustrade. Vansanzio, the Dutch architect of the Medici Palace at Rome, probably took that hint from the Loggietta and covered the palace with panels in bas-relief. The Giant's Staircase of the Ducal Palace, at the top of which are Sansovino's gigantic statues of Neptune and Mars, is said to have been designed by Riccio, or Rizzi, the architect to this part of the Palace, and to the front next the narrow canal which is spanned by the Bridge of Sighs. The architecture of the piece at the top of this staircase consists of the large central archway and two smaller ones on either side. Over the centre of the main archway is the Marzocco, or winged lion of Venice, with a book under its paw. The frieze of the entablature is enriched with roundels of marble, with highly ornamented frames, and between these are festoons of fruit with a patera in the hollow space left by the festoon. On either side of the lion are charming panels of cupids supporting shields, with a Doge's cap on the top of each of them as a crest. The arches spring from piers and in front of each pair is a deep pilaster. Between the outer arch which starts from the pilaster and the inner one that starts from the pier, there is a very rich band of ornament. Over the pilaster is a narrow panelled pier, filled with trophies of armour and spoils, the spandrel of the arch beneath the entablature is ornamented with floral ornament. The rest of this side in the court is very much simpler in form, the ornament consists mostly of medallions hung up with ribbons between the columned windows, said to have been designed by one of the Bergamaschi. The side of the Ducal Palace next the canal consists of narrow arcades treated after the manner of the front next the Giant's Staircase, but much less elaborate. On each story balconies jut out here and there, with pierced geometrical panels supported on cantilevers that run through the frieze of the entablature below. On account of the narrowness of the canal and the great height of the building it is very difficult to get a proper view of it, unless you can get into the houses opposite.

The architecture of Riccio is most severely criticised by Mr. Ruskin, who thinks the architecture of not much better character than the architect, who was not celebrated for his uprightness. I also give you a view of The Cicciaporci Palace, Rome, said to be by Giulio Romano (see lithograph).

THE ARCHITECTURAL ASSOCIATION:

LEAD WORK.

AN ordinary meeting of this Association was held on Friday evening last week in the Meeting room of the Royal Institute of British Architects, No. 9, Conduit-street, Mr. Hampden W. Pratt, President, in the chair.

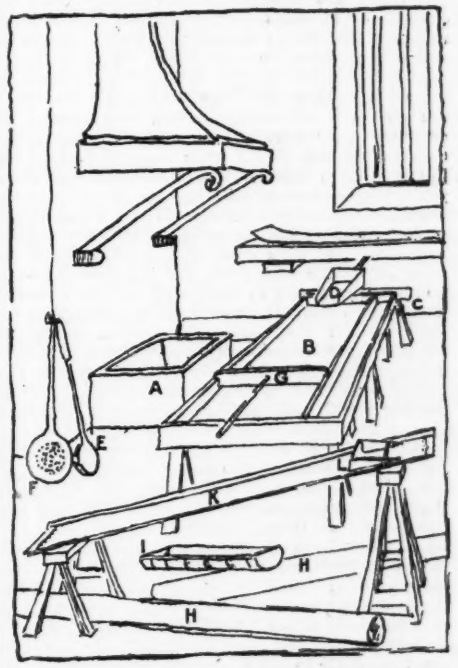
The minutes of the last meeting having been read and confirmed, Messrs. E. G. G. Bax and C. Gilbertson, were elected members of the Association.

Mr. G. B. Carvill proposed a vote of thanks to Mr. Sidney R. J. Smith, for allowing the members to visit, on the 5th ult, five houses in Park-lane, and for his hospitality on that occasion. This having been agreed to,

The Chairman said he should like to call the attention of the members to a special meeting of the Discussion Section to be held on March 9, when Mr. P. J. Waldram, of the Institution of Junior Engineers, and Mr. Sydney Beale would open a discussion on "The Desirability of a Closer Relationship between the Engineer and the Architect." The meeting would be open to all members of the Association, and would commence at 7.30 p.m.

Mr. F. W. Troup then read the following paper on "Lead Work, Plain and Decorative," the reading of which was interspersed by practical demonstrations of casting, tinning, &c. :—

"I propose to introduce to you the subject of to-night's discussion by quoting from a most interesting paper by Burges. I think no



Plumbing Plant of the Seventeenth Century (Traced from a print in "Principes de l'Architecture," Paris, 1690.)

The following are the references to the lettering :—

"A. Fosse à fondre le plomb.
B. Moule pour le table de plomb.
C. Trétau pour porter le poële.
D. Grand Poële de fer à verser le plomb.
E. Cuiller à puiser.
F. Cuiller percée.
G. Rable.
H. Rondin pour faire les tuyeaux.
I. Polastre (?).
K. Moule couverte de toile pour les petites tables de plomb.
L. Rable."

apology will be required for doing so as the paper is buried in the 'Ecclesiologist' of December, 1856, and a footnote explains that it was previously published in the pages of the *Builder* but had been revised by the author for the 'Ecclesiologist.' The title is 'Ornamental Leadwork,' but many of the remarks and methods described bear quite as much upon plain roofing work :—

'At the present time perhaps there is no metal considered less suited to the purposes of the fine

arts than the subject of the present notice. However, the great artists of the middle ages thought differently. Their architecture was (and always must be) eminently of figures and subjects, and accordingly they compelled even lead to bear its part in the great poem of Christian art. They cast it into ornaments, they hammered it into figures, and with the help of tin, they executed imperishable paintings, which, when placed beyond the reach of man, have far more successfully resisted the ravages of time than the crumbling sculpture or the worm-eaten dossel.

At the same time, it must be confessed that the intrinsic value of the material has but too often been the cause of its destruction, and although, as citizens, we can scarcely blame the French Government for melting even the historical lead into bullets for the defence of the country, yet, as artists, we must ever deplore a necessity which has left us vestiges so few that our curiosity is rather stimulated than our inquiries gratified. I can, therefore, only pretend to put before you a very short notice of the various objects which our forefathers produced in lead and tin—beginning with those belonging to the Church—the great art patroness of the Middle Ages.

Roofs.

Let us imagine the architect had got up the carpentry of his roof, and then proceed to ascertain how he went to work to cover it; and here it may be premised that his roof is a very different one to those designed by the late ingenious Mr. Peter Nicholson. However, the only points of difference with which we have to do at present are, first of all, that there is no ridgeboard, the rafters meeting one another at top whilst they are kept in a straight line by means of a ridge-beam below; the second point of difference is that the king-posts stand up above the roof for a considerable distance.

In the thirteenth and early part of the fourteenth century, however, when continuous [leaden] ridges were used, composed of isolated members as at Amiens or Exeter, the ends of all the king posts, except that over the apse, were cut off, as they would not be wanted for the support of the ridge.

Now the architect, in those days as in these, had the choice of tiles, slates, or lead to cover his roof with; but then, as now, the latter was by far the most costly and the more esteemed. Still even tiles and slates under his hands became beautiful. The tiles were coloured with variously coloured enamels as at Mantes, while the slates had their edges cut into divers shapes, and were disposed in patterns according to their tints. When lead was used it was generally very thick. That at Canterbury, I am told by Mr. Austin, runs about 12 lb. to the foot. The roof being boarded, the lead was laid on much in the same manner as at the present day, except that the sheets were somewhat narrower (about 2 ft. in between the rolls), and that these latter were formed by turning over the sides of the sheets, without the assistance of the wooden rolls used by the modern plumber. If there was no ridge the rolls were continued over the top of the roof and a little way down the opposite side so as to allow the sheets to hang well on. If, however, there was a ridge, the method was rather different. And here it may be observed that, during the Middle Ages, everything susceptible of having a ridge applied to it had one. This was the case even with the miniature enamelled "Bahuts de Limoges," and still more so with regard to the large silver chasses for reliques, some of the crestings of which are most beautiful though of course treated according to the different nature of the material employed. The tiled roofs had tile crestings, several of which had been discovered at Great Malvern, but the slate roofs were treated in a similar manner to the lead ones, to which latter we now return. We have hitherto supposed the roof to be boarded and covered with lead, with the rolls continued over the apex. Now, as these rolls would interfere with the ridge, they must be suppressed and accordingly the sheets of lead are made to finish at some little distance (one foot or more) from the top of the roof, where they are turned in and nailed to under side of boarding. The apex was not generally covered by two boards butting up against each other; on the contrary, it was thought better to cut a sort of trough out of the solid, and to apply it reversed to the top of the rafters so as to form as solid a foundation for the ridge. Irons in the form of an inverted Y were nailed to this inverted trough at proper intervals, and then the piece of lead forming the ridge piece, having had corresponding holes cut in the middle, was slipped over them. The next thing was to cast the various members of the cresting, to solder them together (for they could only be cast in halves), to slip them over the projecting irons, and lastly, to solder their lower extremities to the leaden ridge piece. When nails were used, the heads were covered with a square piece of lead soldered at one end; and as this solder extends some way down, and is marked with the iron, at a little distance, the whole looks like a coat of arms with a chef.

Amiens affords an excellent example of the very simplest form of ridge. Unfortunately there is nothing to tell the date by, as the fleurs-de-lys have been mutilated on one of those occasions when the French nation, wearied with kings, expelled the dynasty and defaced its badges. Most probably it is a sixteenth-century restoration of the thirteenth-century ridge; for the spire was burnt down, and with it part of the roof, in 1527, and when restored shortly after, a very different form of ridge was in vogue. At Rheims the principal member of the cresting was two feet high and one foot six inches wide (French measure), that at Exeter is about one foot high by ten inches wide. I am afraid that even the oldest part of the Exeter ridge must be considered as a sixteenth-century restoration of an earlier one. Mr. Cornish, who conducts the works of this cathedral, has presented one of the ornaments to the Architectural Museum, where it is now to be seen; it is very badly cast, and ill-adapted for its position as the upper part is heavier than the lower.

I must now go for authorities to the work of M. de la Querriere, who has given me several specimens of ridges, but, unfortunately, has said nothing about their construction, which, however, was all upon the same principle; and we now see why the king posts are carried up, for to them is nailed at some distance above the apex of the roof a bar of iron loosely covered with lead. The ridge, which is always of an open and delicate pattern, is cast in two halves as usual (except when it is very light and open), is then soldered at bottom to the ridge piece, and at the top to the lead pipe covering the iron bar.

Where slates were used, another decoration to the ridge piece was the application of long-pointed strips of lead alternately pointed and curved. These were cast and soldered on to its lower extremity; they occur at the Chateau Meillant, Seine Inférieure, at the house of Jaques Cœur and at the Hotel Cujas Bourges.

Crockets.

If they are rather large, each crocket has a thin piece of iron covered with lead (copper will do alone), one end of which is soldered to the lead pipe, and the other to the extremity of the crocket. And, while on this subject, it may be as well to show how the largest crockets, such as those on the spire at Amiens, which are 1 ft. 6 in long, are managed. An iron about 1¼ in. square, has its end split into two parts, so that it resembles the letter T; the split part is nailed on to a single rafter, and the other, which juts out, is covered with lead; on the upper surface is soldered a piece of very thick lead, to which some of the upper leaves of the crocket are soldered; the end leaves next the rafter and the stalk are, of course, fixed to the lead covering of spire as usual. Another way of treating the medium crockets was to make the iron in the form of an L, fixed in a similar manner; the projecting part, covered with lead as usual, is soldered to the inside of the back of the crocket, in the body of which two holes are bored to let out the wet. The crockets running up the sides of the dormers are usually executed in this manner.

Figures.

A very favourite finish for a roof, especially at the east end, was a figure of the patron saint, beaten out in lead. The following extract, given by M. de Laborde, from the accounts of St. Maclou, Rouen, gives us some information upon the subject, as well as the names of the artists. "1514. To John Pothyn, sculptor for having carved a prophet in walnut wood, to serve as a mould and pattern for the works in lead." All, then, the plumber had to do was to hammer sheets of lead over the wood statue until they fitted to the shape. These were then cut off, and soldered together again with an iron frame-work inside to prevent the figure from getting out of shape, and as a means of securely fixing the whole affair. At Paris, where several of these figures have lately been executed for the Ste. Chapelle and elsewhere, cast-iron moulds are substituted for those in wood, as will be seen by the following notice, which I owe to the kindness of M. Gerente of Paris.

"You were correct in thinking the angel at the chevet of the Ste. Chapelle is made of lead. Wood and lead are the only two materials used in the fleche; for all the flat surfaces cast lead is employed, but for the ornaments and figures milled lead is hammered on to cast iron moulds. In a few instances lead castings are met with, such as the suns of the arcades. There is no zinc used at all. The moulds for the figures are made, of course, in several pieces, the different parts of the figure having been beaten up upon them, are joined together soldered inside, and the joinings outside made with the hammer. As to the decoration, there is no tinning at the Ste. Chapelle, but merely gilding, which is done with two coats of oil yellow tint varnish, and over it gold in leaf."

There is one difference between the ancient and modern leaden figures, which, I think, deserves to be noticed. The latter are soldered together like a modern work in bronze, *i.e.*, the whole of the surface is homogeneous. Now, as far as I could ascertain by reference to the figures on the spire at Amiens, the former (*i.e.*, the ancient ones), although soldered in parts, are, nevertheless, in two or three pieces, the joint probably being made by means of a lap, as in roofs, and the places of junction concealed by means of the folds of the drapery. In fact, in a similar manner to the ancient bronze statues at Herculaneum.

The same method was carried out in detached pieces of carpentry covered with lead, such as pinnacles, where one (if not two) of the edges is made to lap, never by solder. It would appear to have been a principle to lay the lead as loose as possible, and to be very sparing in the employment of solder. It still remains to be proved which is the better of these two ways of constructing figures in lead. That of the moderns is certainly the strongest. The only fear would be the chance of it cracking for want of the necessary play for expansion.

This fleche is truly a *chef d'œuvre*, whether we consider it with regard to its carpentry or its lead work. Among the many beautiful wooden spires still left us in France this is beyond all comparison the best. Every decoration possible to lavish upon it in the way of lead work has been bestowed, and that with no sparing hand. Statuary, foliage, gilding, tinning, painting, all are there, and well did it deserve its title of the golden steeple.'

I will now quote from another source, and in this instance we again have recourse to methods practised in France. 'The Principles of Architecture' by Felibien, published in Paris in 1690, gives a succinct description of all the crafts relating to building, with interesting plates showing the workshops and tools used and describing their purpose (see cut, page 227).

Book 1, Chapter xvi. *Of Leadwork.*

'Whilst in ordinary houses and small buildings we can do entirely without lead or employ it very sparingly, this is not so in the case of large edifices; there we require it not only for the ridges of the roofs, for gutters and down pipes, but it is also frequently used, as for example in the Louvre, to lay in sheets between the large stones in place of mortar. Lead, therefore, is largely used in building, and the more so since it can be worked with such facility. The greater part of what we get here comes from England in large ingots called "saumons," weighing 400 lbs. or thereby. Germany also sends us some lead which is in ingots or square "saumons" of 120 lbs. weight, but the latter is dry and less sweet than that from England.

As lead is so readily melted it is easy to shape it into any required form by casting in moulds of copper, plaster or other material.

But as the lead used in buildings is for the most part required in sheets, the following description explains how plumbers prepare those sheets.

A pit is built with sandstones and "terre franche," and this is rendered all round inside with plaster. At the bottom is fixed a little smelting-pot in order to receive remainder of the melted lead, and allow of its being removed more readily afterwards. The pit is raised so that the bottom of the pot is level with the floor. In order to found lead the pit is first heated with charcoal to prevent the melting lead from sticking to the sides, and to help in fusing the metal. When sufficiently hot, the lead and charcoal is heaped in pell-mell and allowed to melt.

Close to the founding pit should be the head of the casting-table to allow of the lead being conveniently and quickly transferred from the pit. This table is sometimes 18 ft. long and 3 ft. or 4 ft. wide, as may be required. It is made of great planks of timber, well jointed and bound at the ends with iron, and having a frame all round 2 in. or 3 in. thick. This frame rises an inch or two above the surface of the sand which it encloses, and which covers the top of the table. The sand is prepared by moistening and mixing it thoroughly with a piece of wood, called, working the sand. Finally, it is smoothed with a plane of copper to render its surface level and even before casting on the lead.

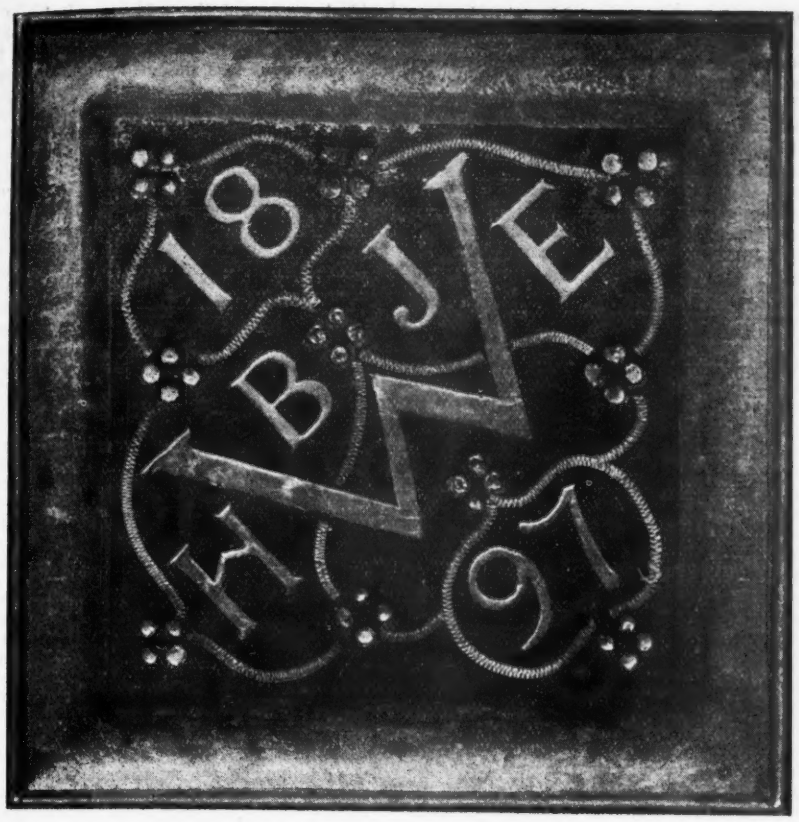
When the metal is melted, a great iron pan of triangular figure with flat bottom, square end, and sides tapering from back to front is brought forward and heated over the pit. It is then laid with its front edge resting on one end of the table, and the back part on a tressel rather lower than the end of the table. Into this iron pan is emptied, with a large ladle, the contents of the founding pit, charcoal, and altogether sometimes as much as fifteen or sixteen hundred pounds weight, or even more.

The charcoal is now removed and the lead well strained with a perforated ladle, after which the handle of the iron pan is raised, and the melted lead shot over the surface of the table. It is pushed forward with a strike the full width of the table, and 4 in. deep, by about an inch thick.

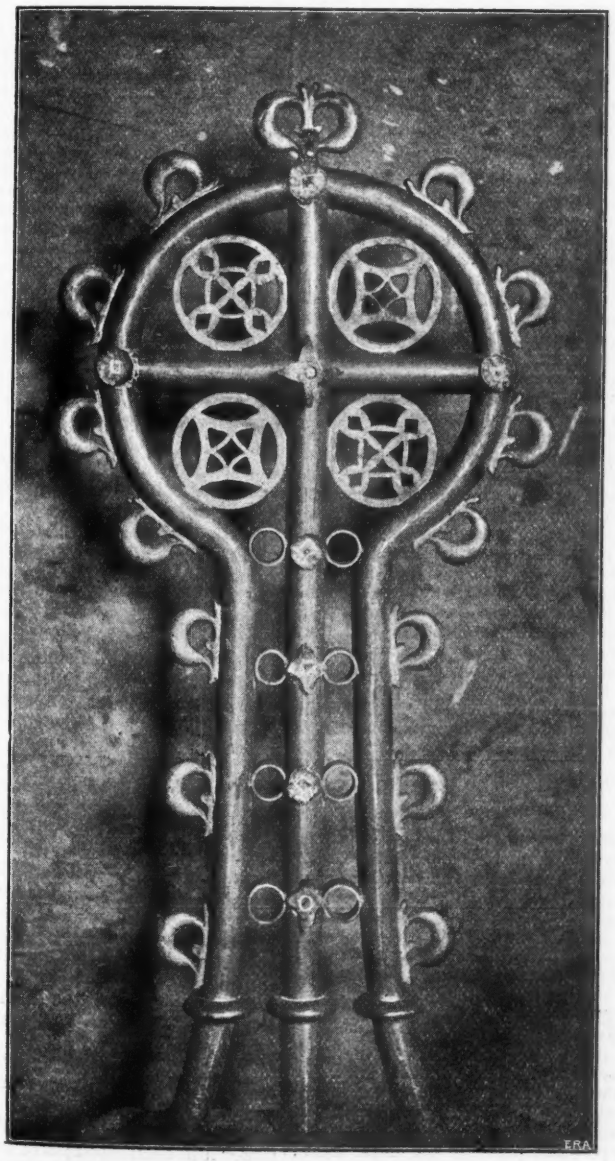
The two ends of the strike run on the rails forming the sides or frame of the table, where the strike is notched to allow of the lower edge dipping down into the frame just far enough to leave, as it sweeps over the surface of the lead, the required thickness of sheet.

When the sheet is thus cast and cooled, the edges and ends are trimmed by cutting off a strip with the draw-knife, leaving the whole sheet clean and square.

There is another way of running sheets of lead when they are required, narrow and very even. In this case the table has a rail on one side only, and is made as before of a number of large wooden boards. In place of covering it with sand, a piece of stuff or woollen cloth is tightly stretched over the surface, and above this a sheet of linen or fine calico. The frame is not placed level, but has a good slope, one tressel being higher than the other. The strike consists of three pieces of wood fastened together. The centre or cross-piece is 7 in. or 8 in. deep, and of whatever the width the sheet of lead has to be. To each end of it and at right angles are fixed the



Lead Panel designed by Mr. E. S. Prior.



*Cross on Gable of Church in Canning Town (in unfinished state) made by Mr. Dodds.**

*The ornamental parts of this cross were made at the School of Arts and Crafts in order to show how to make and cast small articles in a plumber-made *lead* mould, which I showed and explained at the Association lecture. The frame-work of the cross is an ordinary 2-in. lead pipe with an iron rod inside to carry weight. The leaden base is not shown in the photograph.—F. W. T.

side pieces, which are 12 in. to 14 in. long, and taper from the same depth as the cross-piece to nothing. This strike is placed on the upper end of the table with the cross-piece towards the low end and the tapered ends of the sides towards the top.

When the lead is melted a morsel of paper is dipped into it to test whether it is hot enough to run and yet not so hot as to burn the linen covering the table. If the paper catches fire and burns it is too hot, but if it does not scorch and yellow a little it is not yet hot enough to run properly. In placing the strike in position a card is placed under it to form a bottom, and receive the molten lead which is poured into the strike from a ladle. The card serves to protect the linen from scorching during the preparation. When all is ready the two men, stationed one on each side of the table, slide the strike down over the linen, allowing it to move slowly, or pulling it rapidly, according as they wish to leave a thick or thin sheet of lead behind the strike.

The thin and even sheets of lead made by this method are those used, as already mentioned, in the jointing of the masonry at the Louvre and other great buildings.'

The great question of milled versus cast lead I am not prepared to solve for you, but I may offer one or two remarks bearing on the subject. We are told by the advocates of cast sheet lead that it turns to a silvery grey or white in course of time, whereas milled lead always turns black on the surface. I believe there is not much doubt about the latter part of the statement, and certainly the beautiful patina on the surface of many old roofs of cast sheet-lead go in support of the first part of the theory. But I think it wants some further investigation and proof to show that cast sheet-lead under modern conditions—which of course includes the metal as well as the atmospheric conditions—will also oxidize to a silver grey or white patina. The lead used on the roofs of St. Paul's and the buildings attached to it are, and I believe always have been, covered with cast lead. From these roofs we might therefore be able to judge conclusively, as there is a constant repairing being carried out in which freshly cast lead is used. But I gathered from Mr. Penrose and his plumber some years ago that the stock of old lead was adhered to and simply re-cast, and in the stock I distinctly remember seeing piled up in the crypts fragments of very old lead waterpipes and even several examples of Roman pipes. An examination therefore of the condition of the lead on these roofs would throw light on only one half of the question, namely, how the old metal stands and how the surface "goes" when oxidizing under the modern London atmosphere. I might here read you a letter from Mr. Crickmay to Mr. Thackeray Turner, which is interesting and gives useful hints to both architects and plumbers. It was quoted by Mr. Turner in a short paper written for the Art Workers Guild, and this at Mr. Lethaby's behest was kindly given over to the lead-working class at the Central School of Arts and Crafts.

Nethbury Church, Dorset.

'What I told you in reference to the lead covering of this roof was that the old cast lead roof had been on for 100 years, and was perfectly sound, but that a piece of roof there, which had been covered with 7 lb. milled lead had only been on for twenty-five years, and it was eaten full of holes almost like a sieve.

This arose partly, if not entirely, from the fact that it was an oak roof under, and the acid from the oak acted upon the lead and caused a deposit of white lead which destroyed the milled lead.

But apart from this, it is the fact that the sun acts readily on milled lead, causing it to go up in ridges, get very thin in the hollows, and soon develop cracks. The sun does not so readily act upon cast lead, consequently does not get thin in places.

I invariably use cast lead for lining sinks in which hot water is to be used, and they last for a very long time, but if milled lead is used they rise up in ridges and crack in three or four years.

(Signed) G. R. CRICKMAY.'

Note also the following scientific testimony:—

'Green oak-wood from the quantity of acetic acid which it contains, should not be used in contact with lead for building purposes.' 'The vapours of acetic acid corrode it rapidly.'—*Miller's Inorganic Chemistry.*

As soon however as you come to ornamented lead work there is no longer any question as to whether cast or milled lead is best. With the latter you are confined to bossing, whereas in casting your sheet it is not only possible but very easy to imprint patterns or letters or ornament in the sand bed, and it is still possible to boss or beat up the cast sheet to what extent you please after the casting is complete. Tin-

ning and engraving can be done equally well on either kind of lead, but in the cast sheet all your work, however wrought, gains by the superior texture of your ground surface.

I made some mention just now of the difference in the metals themselves, between old and modern lead. The chief difference consists in the greater purity of modern lead. Silver is frequently found in conjunction with lead ores and formerly this was but partially extracted. By modern perfected methods it is profitable to extract the silver if the lead contains only a few ounces to the ton. Whether this absence of silver in modern pure lead has any affect upon the colour to which the surface oxidizes or 'weathers,' as some have held, I am unable to say, but I think there is no question that the old lead was somewhat harder and more self-supporting in exposed positions from its slight admixture of silver and traces of other metals (tin, iron, copper, and sometimes antimony and manganese), alloys being nearly always harder than the principal metal in the composition. In this connexion it is interesting to note Burges's remarks upon window leads (I quote from the paper referred to already). 'Now, the lead for this purpose was cast, not milled; it was also much narrower than the modern, but contained, if anything, more metal. The consequences are that much of it is good up to the present time, while our flat, broad milled window lead *having its grain broken by the milling*, and presenting a very thin and very broad surface to the air, becomes rapidly deteriorated. At Beauvais, I saw some lead which was probably put up at the end of last century, quite in a state of oxidation, and at Tournay, where the whole immense windows of the choir have been filled with stained glass, at no very distant period a very large expense will have to be undergone to fresh lead the whole, as nothing better than the common cottage window lead has been employed.' Note here that thin lead soon oxidizes and absolutely perishes altogether. This may seem strange when we remember how everlasting lead sometimes seems to be. The reason is very simple, and should not be overlooked. A fresh clean surface of lead tarnishes very rapidly when exposed to the atmosphere, owing to the formation of a thin, closely adhering film of oxide. This film protects the metal from further change, excepting that itself in course of many years becomes (in the case of cast lead) a fine patina of appreciable thickness. Where the lead itself is of considerable thickness, the loss of strength from this oxidation of the surface is inappreciable, but when the lead has been rolled out so thin that the film of oxidised metal bears a considerable proportion to the whole thickness of the metal, it is no longer able to serve its purpose, and tears or drops away as strain or wear and tear come upon it.

Now a word as to the laying and working of lead. Whether milled or cast, it matters not, there is room for much improvement on modern methods. You have only to look at the exhibits sent in by the students of the Polytechnic schools for the prizes to see that the ideal aimed at is all wrong. The results are often wonderful and extremely praiseworthy if only they were of any use. But the working of the lead as at present taught seems to me to be labour misapplied. What practical value is to be had from a three-branched soil-pipe beaten out of one single sheet of milled lead? The dexterity and patience required to do such work is astounding, and so is the patience and perseverance required to build a full-rigged model ship inside a glass bottle—a seventh wonder to be seen in exhibitions and shop windows. I have, of course, taken an extreme example from what I have seen in the work of the students, but all the rest is 'tarred with the same stick.' Mechanical precision in lead work is not only wrong from its being labour misapplied, but it renders the life of the metal shorter, its cost greater, often prohibitive, and certainly does no good to the woodwork it covers. Plumbers with their 5 lbs. or 6 lbs. milled lead nowadays often beat and dress the lead over the wood like a coat of paint. The result is that frequently the lead cannot expand and contract freely, as it ought, to prevent tearing and buckling; and the wood under—well, the closer you cover wood the more chance of dry-rot, and if there is any acid remaining in the wood, the more certain is it to attack the under side of the lead. What I should like to see would be a closer following after old methods which are invariably simpler and more straightforward. My friend Mr. Dodds used to say, he admired the old gutters which seemed to be laid by cutting out a piece of lead the right shape and walking over it once or twice on your stocking soles. That was all. Nothing more is wanted. The young plumber of the present day is taught to dress and fit the sheet hard down into every angle and beat it close over the drip. For result you get the lead, as often as not, hard fixed at each end, and under a hot sun it must buckle, under a frosty sky, tear. And at each drip the water is drawn up by suction or capillary attraction between the two sheets of lead, and if there be any snow in the gutter, as like as not the water gets up to the woodwork. By the old method all this is left loose and easily fitting, one sheet sliding over the other whether in expansion or contraction. There is no possibility of capillary attraction taking place at the drips or elsewhere, for the lead goes gently rounding over the drip, leaving a clear space between it and the turn up of the underneath sheet.

Nor can I see any special merit in beating things up out of a single sheet of lead when the same object can be attained more directly, more simply, and more rapidly by the help of solder. There are limits to everything, and soldering in plumber work *may* be overdone, but soldering seems to me to be the legitimate treatment for lead. The joining of two pieces of lead together by soldering is as pre-eminently suitable to the material as welding is for wrought iron, or brazing for copper. Such problems as to beat up a rain-water head from one sheet of milled lead ought not to be set, except as a subject for students' practice—a kind of study in lead working—and even then it is dangerous, as likely to result in a mere display of manual dexterity and skill, and to develop into such methods of laying and dressing lead as I have described and condemned already.

Now one word as to solder, tinning, and decoration of lead. I will quote again both from M. Felibien and Burges's paper. The following remarks in the old French book on solder and tin are interesting:—

'The solder used by plumbers for ordinary work is made by melting together 2 lbs. of lead with 1 lb. of tin. Its quality is known by pouring some from a ladle on the floor or on a table, when, if it be good, it will form what are called "partridge's eyes"—little clear shining spots.

Tin also comes from England in great ingots weighing 400 lbs. Some are called "rose" ingots, others "ring," on account of the different brands. The "rose" is the mark of England; the "ring" the mark of Rouen, where the metal is examined on arrival. That which comes first from the melting pot when tin is being smelted is more refined and sweeter, and on this better quality the inspectors stamp simply a ring; and according to the different quality they put one, two, or three crochets called "griffes"; the worse the quality, the more "griffes" are put until in the very brittle and bad samples they break a corner off at some point of the ingot. There are also other marks totally different put on by merchants and makers, but good judges of the metal do not let these marks weigh in estimating the quality of such samples.

When plumbers wish to tin sheets of lead, they have a tinning furnace full of hot charcoal, on each side of which a man stands holding up and heating the sheets of lead. Leaves of tin foil are laid over these, and as the sheets get hot and the tin melts, the tinning is accomplished by rubbing and spreading it over the surface with tow and resin.'

Now we come to Burges:—

Polychromy.

'The architect having thus finished his roof, which we may observe was an affair calculated to last for four or five centuries, not simply ninety-nine years, neither more nor less—he thought that as so much pains and expense had been taken to make it strong and beautiful, it was worth while to go a little further, and give it all the advantages of colour.

How was this to be carried out? Direct polychromy could only be used in the more protected parts; and oil gilding, although in some situations very effective, hardly contrasts sufficiently with the lead to make it desirable to employ it in large quantities, to say nothing of the excessive expense.

The problem was solved by the use of tin, whose imperishable brilliancy contrasted well with the dulness of the oxidised lead, and which, being applied by fire, became part and parcel of the latter metal, and could neither be washed off by the rain like the gilding, or cracked by the sun like the oil painting.

The process of tinning is thus performed; the lead being first of all covered with a tolerably thick coating of lamp black and size, and the pattern traced with a point; all that part of the surface to be tinned is removed with a shave hook, so as to leave it clean and bright; a little sweet oil is then rubbed over, and the solder applied and thinly spread with a copper bit in the usual manner.

The next thing, of course, was to fix the lead in the position it was designed to occupy; for the tinning was done in the workshops, although occasionally it was performed when the lead had been up many years. Thus the spire of N.D. at Chalons-sur-Marne was probably constructed in the fourteenth century, but we must refer the tinning to at least a century later. In this case the process was the same, only much more tedious, as the workman was only able to apply so much tin as the end of his axebit would take up; and accordingly we find the work in the instance under consideration very coarse and rough, contrasting strongly with that on the dormer window at the east end of the same church. All the leadwork of the roof was more or less susceptible of this decoration, but it was generally confined to the more ornate parts, such as the bases of the girouettes, and the dormer windows; but more especially to the ridge pieces, which latter contrasted well with the long dark body of the roof, which was left plain. Almost all the principal mediæval edifices of France present more or less of this decoration; but I am not aware that any traces of it are to be found in England, although M. Durand, who executes the leadwork for the Sainte Chapelle, informed me that he had heard of some existing in England—he thought at Shrewsbury.

It has before been observed, that the recessed pediments of the dormers, their sides—when protected by eaves—and other sheltered situations received polychromatic decorations. The colours were not applied directly upon the lead, but upon a tinned surface, the lines alone being left to oxidise. The oil colours used upon the tinning were transparent, so that they might receive the full benefit of the brilliancy underneath: these paintings were easy to restore, for their outline was unalterable. I should imagine the subject on the cheek of the dormer at Chalons-sur-Marne to have originally been coloured, although only the tinning and a few traces of the mordant of the gilding remain. This supposition is rendered more likely from the relation of M. Barbar, an old inhabitant of the town, who told me that when a boy, at the beginning of the century, he lived close to the church, and that one night a piece of lead fell down from the roof into the yard, the which piece was enriched with a variety of positive colours, such as red, green, &c. The plumber to the hospital at Beaune also informed me that traces of colour were found on the girouettes, when under the process of restoration. According to his account the colour was thus distributed: the bases were painted in chevrons in red (and tin); the stems had a ribbon pattern; the rondels were blue, and the ornaments gilt. At present the only perfect specimen of polychromatic decoration upon lead I can refer to is on the inside of the second stage of the Amiens flèche.'

In conclusion, I would recommend those who wish to study the possibilities of the plumber's art historically to avail themselves of Mr. Lethaby's excellent little work, where they will find a most interesting chronicle of the best work to be found in this country in all periods, besides invaluable suggestions and guidance for the worker in lead. I have in this paper referred very slightly to ancient examples, although, as many of you know, it would be easy to discourse for hours on the multitude of beautiful examples of coffins, fonts, cisterns, pipes and pipe-heads, spires, roofs, ridges, finials, &c., which remain all over this country and abroad. These form an attractive array for any student, and, as every town has its examples, at any rate of the later developments of the plumber's art, an interesting study might be made of the varying types in different localities. This, however, is not my object, and I would rather warn you against 'cribbing' or reproducing old examples. What I wish to show you is the simplicity of the old methods of work, by what simple ways, almost child's play, the ends were attained. And, again, from the very ease with which ornament can be applied or wrought on this *lead* you must beware of the opposite pitfall and not imagine that you have reached the goal when you have covered your material with beautiful ornament.

Learn the possibilities of your material before you attempt to design in it. You architects cannot possibly study thoroughly *all* the materials you have to deal with. But it is always possible to study *one* or *two*, and the doing so will let in a flood of light upon all the others. This knowledge will make you very modest indeed in attempting to design with blacklead, white paper, and a T square. You have only to try *once* by designing first on paper and then attempting yourself to carry out that design in actuality to learn what a poisonous and deadly thing it is for a craftsman to have to follow line for line 'the architect's design.' All freedom is gone; what would have been a quaint twist, or an amusing play of colour or shade, is sacrificed and killed in order to follow absolutely the black and white skeleton on

paper. I repeat, you have only to try it once in any material you like to find the truth of what I say.

When once you have learned something about your material, paper and pencil are very useful, but you will use them in a more tentative way, knowing that many things occur to render a slight change a necessity in order to get the best result from what you have in hand: the drawing is but a means to an end.

I have already quoted so fully and freely in this paper that I cannot do better than finish by quoting from Mr. Lethaby's 'Leadwork,' already referred to:—

'New design must ever be founded on a strict consideration of the exact purpose to be fulfilled by the proposed object, of how it will serve its purpose best, and show perfect suitability to the end in view when made in this or that material by easy means. This, not the torturing of a material into forms which have not before been used, is the true ground of beauty, and this to a certain extent is enough without any ornamentation. Ornament is quite another matter: it has no justification in service, it can only justify itself in being beautiful.'"

The Chairman said that they were very much indebted to Mr. Troup for the practical demonstrations of some of the methods of treating lead as well as for his interesting paper. There was no better method of illustrating a paper than Mr. Troup's.

Mr. W. H. Seth-Smith, in proposing a vote of thanks to the lecturer, said that since Mr. W. H. Lethaby's excellent little manual on lead-work had been written greater interest in lead-work had been shown. In many old houses in the country a great deal of ornamental lead-work had been used, not only in the house but in the garden. Mr. Troup had shown them some simple ways of using lead-work ornamentally at the present time, and must have made many of them think of some delightful ways of treating rain-water heads, ridges, crockets, &c. They would feel stimulated to encourage their clients to use more beautiful decorative work of the kind, notwithstanding the greater cost. They were very much indebted to Mr. Troup for giving them the result of his long experience, as well as for his practical demonstrations.

Mr. Matt. Garbutt, in seconding the vote of thanks, said that one of the many revivals which they had witnessed recently was in regard to the artistic treatment of lead. He had been rather surprised to find that in London some beautiful samples of old lead work could be found, and he instanced the statue of Queen Anne in Queen's-square, Bloomsbury, which was of lead, though he did not know whether cast or hammered. Mr. Troup had stated that cast lead used in sinks did not buckle so much under heat as did milled lead. Perhaps it was because some of the old ornamented specimens of lead were cast that they did not appear to sag so much under the heat of the sun as did modern work, and he had come across vases in gardens which were very little distorted by the heat of the summer sun. As to colour on lead, the grey patina, possibly due to the presence of a small amount of silver, was very striking. It was very well-known that bronzes were used, especially by the Japanese, which produced an extremely fine grey patina, due to the presence of silver, and a very slight variation in the composition of an alloy almost always produced a difference in the colour of the patina. The fine, rich, purples that one sometimes saw, depended upon the presence of a small quantity of gold in the alloy. It was quite new to him that there had ever been any polychromy on lead. There had been a controversy about coloured marble in architecture, and it was very interesting to find that a material like lead had been treated as a ground for coloured work. But apparently the lead had to receive a coating of tin before it would take the colour. He did not agree with the lecturer that soldering lead together was equivalent to welding iron. When iron was welded the jointing material was exactly the same as the materials joined, and they became practically one; whereas in soldering the joining material was different from the materials joined, and the joint was a point of weakness, for the solder melted at a lower temperature than the other materials. He also thought that generally a soldered joint was stiffer than the lead it joined, and that would produce cracks.

Mr. H. Longden said that there used to be a good deal of lead mining in Derbyshire, but he was afraid the ore was now worked out. The Romans worked these lead mines, and there was a very interesting discovery made there within the last year or two of a pig of lead with the Roman mark upon it, which had been traced back to the second century. He believed that what Mr. Troup had said was true as to the silver in the lead making it better. Of course, in the modern process the silver was extracted, and he believed the silver in the lead had something to do with the excellence of the surface of ancient work. At St. Paul's the old lead was melted over and over again, though no doubt a little fresh lead was put in each time, and he believed that was the way that people who melted metals were accustomed to work. In regard to the application of colour to lead, he believed that he had seen some drawings by Mr. Troup, of St. John's College, Oxford, with some old coloured lead work shown. This was a beautiful example of what could be done.

Mr. A. T. Bolton said that it was very interesting to notice how the plumber's trade, which used to be treated as the fag end of the specification, with which nobody took any trouble from the point of view of design, had now come to the fore again. The artistic part of the specification used to end with the joinery, and very few people were aware of the possibilities of lead. He remembered some years ago a pupil in an architect's office once saying that he had once seen some fine lead cisterns in London, and the remark being looked upon as absurd. But it was perfectly true, as down in some of the old areas in Bloomsbury there were to be seen some fine cisterns with, in some cases, Jacobean patterns on them, cast in relief. Of course, most people were alive to the fact that beautiful rain-water heads could be made with lead, but the difficulty was the expense, for there were very few jobs on which 7*l.* or 8*l.* for a model in wood could be spent, especially as some people seemed to think that all the rain-water heads of the building ought to be different, which, in his opinion, was a mistake. Something might be done in lead if people would be content with the same pattern, especially for all heads at one level. They could get an excellent lead rain-water head of stock pattern for 50s., which would cost 7*l.* or 8*l.* if the pattern had to be specially made. He thought architects might do more in the way of keeping to lead pipes; for iron pipes were horrible things, besides which they did not last so long as lead pipes. Lead pipes would last over a century and iron pipes but a few years, to say nothing of the constant painting they required. Architects should always insist upon having cast lead pipes, rather than those made by hydraulic pressure, which the plumber always wanted to bring on the job. He believed that Mr. Bodley was fond of using lead for stars and badges on ceilings, and the effect was very much bolder than simple painting. Another use of lead was to form an inlay, as was done in the risers of the marble steps of the Giant's staircase at Venice. He was very glad that Mr. Troup had quoted so much from Burges, because it showed what an extraordinary knowledge Burges had. There was hardly any point of a practical or artistic character that Burges did not appear to know, and it had frequently been said that had Viollet-le-Duc not written his Dictionary of Architecture, Burges would have done so. It was interesting to try to find out how Burges came by so great a knowledge. Apparently he was in the habit of measuring everything that he came across, and it was in so doing that he acquired his extraordinary insight into the artistic and practical capacities of materials. This must be a hint to them all, for it was by measuring and drawing work that their attention was directed to points which would otherwise escape their attention. He (the speaker) might mention that he had been to Chalons, but having only taken the usual look round he had not seen that coloured lead work to which Mr. Troup had referred. It was a very good thing for an architect to have a hobby like Mr. Troup's, for by following it up they could not fail to learn, not only all about the special art which they were studying, but the knowledge which they thus gained of that particular one would also give them an insight into all the others. The probability, moreover, was that in devoting time to the thorough study of such an art an architect far from losing time would in reality learn more about architecture as a whole.

The Chairman, in putting the vote of thanks, said that it had always been a question with him as to the proper treatment of lead—whether it should be cast or hammered—though he had always an idea that the proper treatment was to beat rather than to cast it; but after what Mr. Troup had shown them, he thought that a great deal could be done by casting. The practice of beating up and hammering lead out of one sheet did not seem to be such a great gain as was usually supposed. The use of solder was perfectly legitimate, although, as had been pointed out by Mr. Garbutt, it was not the same thing as welding iron. He was very much interested in seeing the example of coloured lead that Mr. Troup exhibited, for he had previously never seen colour applied to lead. It was the sort of thing one would not have thought possible, or at all events permanent, and he was still inclined to doubt whether it was possible for it to be seen at any distance. In a lead font near the eye a satisfactory treatment of colour might be possible. Some of the best examples of ornamental lead work were to be found in fonts and in cisterns. There were some very excellent cisterns in lead to be found, but he had never been able to determine whether they were cast or not. In regard to the general use of lead, he felt a difficulty in distinguishing as to quality. They could tell the thickness and weight of sheet lead, but unless they were good judges of the material they could not tell what its quality was. He hoped that the quality of the material was not deteriorating, for its possibilities were as great now as ever. In the present day some very poor specimens of lead pipes were to be seen.

The vote of thanks having been put and carried by acclamation,

Mr. Troup said, in reply, that as to the statue in Queen's-square, he should say that it was certainly cast. In such a material it was always possible to cast the figure in parts and solder them on, as it was easier to join the parts of a lead statue than of a bronze one. But as a rule they were cast exactly as bronze statues were cast. He was much interested to hear the remarks about the colouring of the different patinas in bronze. It certainly showed that silver might have to do with the beautiful colouring of the old work. Then as to tinning being put on before colour could be applied, that was not always so, for, in the case of St. John's College, Oxford, the treatment was different, and the colour was put on direct. He usually regarded a joint as an opportunity for strengthening an article, for the solder was harder than the lead. In certain situations it might be dangerous to use a solder joint on account of the strain put upon the joint by the expansion of the metal, but in ordinary cases the solder joint gave strength to the article. The process of lead-burning or autogenous soldering, as it was sometimes called, was admirable in every way. It required, however, more skill and more elaborate apparatus than ordinary soldering. When well done a burned joint was theoretically perfect, the two sheets being no longer two, but one. In regard to the making of lead rain-water heads the great advantage was that they could cast the lead in the flat, which was a very simple process. It was only in the later rain-water heads that they got the projecting mouldings, which looked like other material really, and they were never cast; they were nearly always beaten out on a wooden block. The simplest way of making a rain-water head, whether ornamental or plain, was to build it up in sheets and solder them together. It was not surprising that Mr. Bolton was unable to see the colour on the spire at Challons, because it was almost invisible now. As to inlaying, it was very easily accomplished. They need only cut out the design as deep as the lead would permit and then fill it in with the different colours in mastic. Another method of tinning ornament on lead was to paste on a piece of brown paper the shape of the groundwork, tinning in the spaces that were cut away, exactly as one would stencil on a wall. In regard to cisterns, nearly all the fronts were cast, and some of them in very high relief; but he had never come across any that were bossed to any great extent, they were nearly all moulded in sand. Milled sheet-lead was often very much inferior to good pig-lead, and for casting sheet-lead it was very necessary to have good lead.

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The Chairman announced that the next meeting would be held on March 11, when Mr. Hippolyte J. Blanc would read a paper on "The Ecclesiastical Architecture of the Thirteenth and Fourteenth Centuries."

The meeting then terminated.

DRAWINGS FOR THE ROYAL ACADEMY.

As usual, we shall be glad to receive and deliver at the Royal Academy all drawings intended for the Architectural Room which are sent to us in time to be photographed for publication before sending in.

The last day for receiving drawings at the Academy is Monday, March 28, and we can receive none at this office later than 12 noon on Saturday, March 26.

Every drawing must have *two* labels giving the title of the work and the name and address of the author, one affixed to the back of the drawing, and the other attached by a string so as to hang over in front of the drawing, and must be accompanied by a letter to the Secretary of the Royal Academy, giving also the title of the work and the name and address of the author. If more works than one are sent they must be numbered, and referred to by the corresponding numbers in the letter to the Secretary.

Gilt frames *only* are admissible at the Royal Academy.

We cannot provide labels for drawings which are sent without them.

Illustrations.

TWO VENETIAN RENAISSANCE DOORWAYS.

THESE two doorways, the one from the Scuola di San Rocco, the other from the Church of San Giobbe, Venice, illustrate some of the characteristics of the earlier and the later Renaissance as it showed itself in Venice. Scarcely fifty years separate the two, but there is a great difference in their types. In the San Giobbe doorway, about 1470, there is a playful and semi-mediæval treatment of classic elements, and the small statues on the apex and at the springing of the pediment have a decidedly Middle-Age feeling about them. One may notice also the characteristic treatment of the cornice of the pediment, with its crowning member turned round to make a circular ornament at each side.

In the San Rocco doorway, dating about 1517 or so, the "school" classic has predominated, and we have the Roman order on its pedestal, and the much more formal and academic treatment of the details; though it shows, in a certain sense, an increase of architectural dignity.

EXAMPLES OF RENAISSANCE ARCHITECTURE.

THE illustrations of Italian Renaissance buildings contained in these two plates are given as illustrations to Professor Aitchison's fifth Royal Academy lecture. They are all referred to in the course of the lecture, and therefore need not be specially dwelt on here.

We have not been able to illustrate Professor Aitchison's previous lectures, as we were not able to have the illustrations in advance of the lectures. We shall give some further ones in our next issue.

"BENCAIRN," KIRKCUDBRIGHTSHIRE.

THIS house has been designed for a special position on very high ground on a shooting property of the same name in Kirkcudbrightshire. The rock to be excavated on the site is considered suitable for the general building with a rough cast finish, and Dumfriesshire red stone dressings. The slates specified are Tilberwaite green, and the internal treatment in every way simple but substantial. Messrs. Niven & Wigglesworth are the architects.

"HILLSIDE," SEVENOAKS.

THE additions to this house have just been completed. Mr. Henry Eeles, of Sevenoaks, was the builder, and Messrs. Garvie, of Aberdeen, supplied the oak panelling for the billiard-room. The view here given shows the new entrance corner. Messrs. Niven & Wigglesworth are the architects.

ARCHITECTURAL SOCIETIES.

ARCHITECTURAL ASSOCIATION: DISCUSSION SECTION.—The eighth meeting of the present session was held at 56, Great Marlborough-street, on the 23rd ult., Mr. Matt. Garbutt, Chairman of the Section, occupying the chair. The paper of the evening was entitled "Correct Principles of House-Planning," by Mr. P. L. Marks. Mr. Marks explained that the class of house he intended to deal with was the moderate-sized country or suburban detached house. This he did from the points of view respectively of aspect, prospect, privacy, and convenience of arrangement, illustrating his remarks with sketches on the blackboard and diagram plans of executed houses. He contended that a carefully-studied and well-arranged plan should be the first object aimed at in designing a house. Mr. Louis Jacob proposed a vote of thanks to the author for his paper, and the discussion was continued by Messrs. Greenop, White, Satchell, and Hopkins. Mr. Hampden W. Pratt, President of the Association, said it gave him great pleasure to avail himself of this, his first opportunity of attending a meeting of the Discussion Section. During his term of office he wished to become personally acquainted with all the work going on in the Association, and he congratulated the Section on the vigour and enthusiasm with which it carried on its meetings. He believed very much in this class, and he advised all students who had passed through the other classes, and wanted some sort of continuation class, to join it. Speaking on the subject of the meeting, he thought the exercise of common sense in house-planning made many difficulties disappear. He advocated providing a good hall, and, if need be, sacrificing the morning-room to get it.—After some remarks by the Chairman as to the faulty planning of eminent architects, Mr. Beresford Pite, the special Visitor, spoke. In attempting to lay down principles of house-planning, he said, one should use some discrimination. The whole lay-out of a 3,000*l.* house was entirely different from that of a 10,000*l.* one, demanding quite a different scheme and a different scale. Rules of planning for country houses were inapplicable to town houses. He advised members to take every opportunity of studying plans of big houses. Some years ago he, the speaker, made a point of going over all the houses designed by Mr. Norman Shaw, and he learnt many a lesson from the skill and variety displayed in their planning. One should get an auctioneer's order to view these when any were to let. Take every opportunity also of studying the best houses—such mansions as Penshurst, and the many Continental palaces open to visitors, and find out the principles of their planning. He disbelieved in ingle-nooks; they usually meant an unwarmed room. The ordinary bay window was an abomination, and often spoilt the character of an otherwise good room. Not, however, when it was well thought out and placed in positions where it added to the effect of the room—on the long side of a dining-room, or where it would add to the length of a wall broken up by a fireplace, as it did sometimes at the end of a room. Reception-rooms *en suite*, all leading off an ample hall, made a very charming plan for a country house. Careful thought expended on the design of the hall and staircase was never wasted.—The next meeting will be of a special character, in the form of a joint meeting with the Institution of Junior Engineers, and will be held in the rooms of the Royal Institute of British Architects on the 9th inst. Papers will be read by Mr. P. J. Waldram, of the Institution of Junior Engineers, and by Mr. S. B. Beale, of the Discussion Section, on "The Desirability of a Closer Relationship between the Engineer and the Architect."

GLASGOW ARCHITECTURAL ASSOCIATION.—At the usual monthly meeting of this Association, the President, Mr. W. T. Conner, in the chair, Mr. J. A. Williamson, as delegate from the Edinburgh Architectural Society, lectured on "The Wren School." The lecturer approached his subject by a prefatory sketch of Wren's great predecessor, Inigo Jones, and then described Wren's most characteristic works, closing with a criticism of the productions of Wren's successors, and in particular Gibbs, Vanbrugh, and Hawkesmoor. The lecture was illustrated by lime-light views of buildings and original drawings by the architects referred to.

ARCHITECTURAL ASSOCIATION OF IRELAND.—On the 22nd ult. a general meeting of the Architectural Association of Ireland was held in the Grosvenor Hotel, the Vice-President, Mr. J. Howard Pentland, R.H.A., in the chair. Mr. Cecil Orr delivered his second and concluding lecture on the "History of Architecture." In his first contribution he had traced the progress of the art to the Byzantine period, and he now took up the subject at the Gothic period, which he dealt with in detail, pointing out the various errors students should guard against in studying architectural history. He described the different phases of the art till the end of the Renaissance period. Mr. Orr laid special stress on the theory of the influence of early Irish art on contemporary art in England, France, and Northern Germany, in contradistinction to the popular idea of Irish art being influenced by the art of those countries.

ABERDEEN SOCIETY OF ARCHITECTS.—The annual meeting of this Society was held on the 1st inst., when the following office-bearers were elected:—President, Mr. James Souttar; Vice-President, Mr. Arthur Clyne; Hon. Secretary and Treasurer, Mr. John Rust; members of Council: Messrs. Wm. Kelly, A. M. Mackenzie, A. H. L. Mackinnon, George Watt, R. G. Wilson.

ENGINEERING SOCIETIES.

INSTITUTION OF CIVIL ENGINEERS.—At the ordinary meeting of this Institution, on the 1st inst., Sir John Wolfe Barry, K.C.B., F.R.S., President, in the chair, it was announced that nine Associate Members had been transferred to the class of Members, viz.:—Messrs. C. Aburrow, G. Fitz-Gibbon, B. Leslie, Norman J. Lockyer, E. G. Mawbey, D. H. Morton, G. M. Taylor, T. F. Thomson, and W. H. Williams. At the same meeting it was reported that eighteen candidates had been admitted as students. The monthly ballot resulted in the election of two Members, nineteen Associate Members, and two Associates.

COMPETITIONS.

ISOLATION HOSPITAL, RHONDDA VALLEY, GLAMORGANSHIRE.—At the last meeting of the Rhondda District Council, a committee brought up their report and their award on the plans sent in in competition for an Isolation Hospital to be erected by the Council at Ystrad, and recommended the plan numbered 6. This report was adopted, and the successful competitor was found to be Mr. W. D. Morgan, architect, of Ton Pentre, Rhondda Valley. Accommodation is to be provided for thirty-two patients, matron, nurses, and non-resident medical officer, with laundry, disinfecting and discharging blocks, &c. The cost of the proposed scheme is estimated at about 10,000*l.* Ten sets of designs were received.

IRONWORK IN THE DUBLIN SCIENCE AND ART MUSEUM.

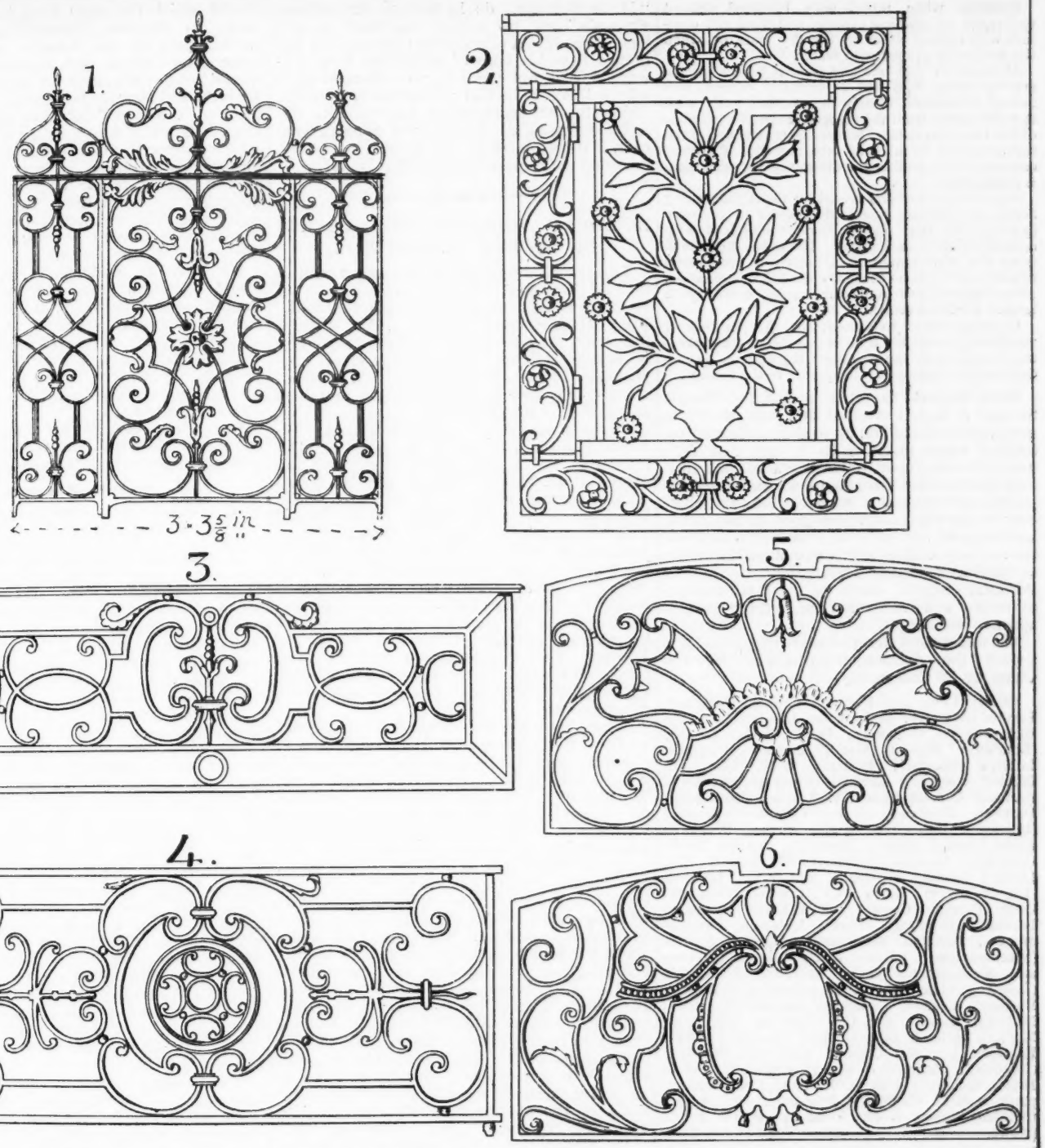
IN the *Builder* for January 9, 1897, we published some sketches of examples of ornamental ironwork in the Science and Art Museum at Dublin, by Mr. D. Alleyne Walter, who since then sent us the second set of sketches here published. Since we received these, we regret to hear of Mr. Walter's death.

The following are the notes which he left on the examples here given.

No. 1. "This elegant example of a small gate is described on the museum label as a 'gate of wrought-iron scroll-work and foliage, in three upright panels. Scroll top on three parts, a finial over each panel.' Nothing, however, seems to be known as to the building it originally belonged to, or other particulars concerning it. From a comparison with other specimens of the kind in the Museum it appears to be of much the same date, viz., eighteenth century, and of French workmanship. The width of the whole is 3 ft. 3¾ in.; height to the top of the centre finial 4 ft. 6 in.

No. 2. This is described as a portion of the 'Peyre Collection,' from which some examples have already been given; beyond the mention that it formed part of this collection nothing more seems to be known with regard to it. It appears to have been much altered and adapted to its use as a 'grille' in late times, shown by the frame, the common locks and hinges, and the displacement of the two bottom rosettes. The whole has been painted a light green colour, and the rosettes gilded. The height is 2 ft. 3¾ in., the width 1 ft. 9½ in.

Nos. 3 and 4. Two plain but good examples of balcony fronts of wrought-iron scroll-



Ironwork in the Dublin Science and Art Museum. From Sketches by the late Mr. D. Alleyne Walter.

work, with foliage. The length of the first is 5 ft. 3½ in., height 2 ft. 4 in.; of the second the length is 5 ft. 1½ in., and the height 1 ft. 11 in.

Nos. 5 and 6.—Two fan-light grilles of wrought-iron scroll-work and foliage. French work, eighteenth century.

This description of 'grille' seems to have been adapted to the head of either a semicircular or segmental-headed doorway; if to the latter, it is called in French a *porte bombée*.

Having lately been shown some designs from a work by Cuvillies Père et Fils (the date of which is unfortunately lost) for balconies, balustrades, &c., the similarity was so great to the examples in the Museum and elsewhere that there can be little doubt as to fixing an approximate date. The design of these grilles, like most of Cuvillies', is graceful, and exhibits considerable ingenuity in the arrangement of the curves. It will be seen that the centre portion of No. 6 seems to have been designed for the reception of some ornament or device which is now lost. The width of these grilles is about 4 ft. 6 in."

SURVEYORSHIP APPOINTMENT. — Mr. James Saunders, A.R.I.B.A., Assistant Surveyor of Oldham, has been appointed to the post of City Surveyor and Waterworks Engineer, Chichester.

WILLING'S BRITISH AND IRISH PRESS GUIDE.—The issue of this handy and useful work for the present year has just been sent us. It is a well-arranged and reliable work, and the present is the twenty-fifth annual issue.

CEMENT ADMIXTURES.

WE have received an important communication on this subject from the Chamber of Commerce.

For the past three years investigations into this matter have been made by the Cement Trade Section of the Chamber. They instructed Messrs. Stanger & Blount, of Broadway, Westminster, to make extensive experiments with mixtures of Kentish ragstone with Portland cement, and also obtained valuable evidence from Mr. D. B. Butler, Mr. Gilbert Redgrave, Mr. H. K. Bamber, and Dr. Michaelis, of Berlin, and others. After full consideration the Section adopted the following resolution :—

That Portland cement be defined as a mixture of two or more suitable materials intimately and artificially mixed in the requisite proportions, and afterwards properly calcined and ground, to which nothing has been added during or after calcination, excepting that an addition not exceeding 2 per cent. of gypsum is permissible for the purpose of regulating the setting.

That the following rule be adopted :—

That if any material whatever excepting 2 per cent. of gypsum for the purpose of regulating the setting be added to the Portland cement clinker during or after calcination, the article so produced shall not be sold as Portland cement, but under some other distinctive name.

That the members of the Cement Trade Section of the London Chamber of Commerce, together with all manufacturers of Portland cement in Great Britain and Ireland who are not members of that Association be invited to sign the following declaration of conformity to the above rule in respect of all Portland cement made by them wherever manufactured :—

Declaration.

"We, the undersigned, hereby agree to conform to and carry out the rule of the Cement Trade Section of the London Chamber of Commerce as set forth in a report made by the Section and adopted at a meeting held on Monday, the 10th of May, 1897 :—[here follows the quotation of the rule above given.]

And we further agree that if at any time any of the parties to this agreement shall by resolution of a majority of those present at a meeting of such parties duly and properly convened in accordance with the practice of the London Chamber of Commerce, such resolution having been duly and properly confirmed by a majority of those present at a subsequent meeting called at not less than fourteen days' notice, be found to have failed to conform to and carry out the said rule, then in such case his or their name or names shall be struck off the list and notice of the same made public in such manner as shall be resolved."

The above resolution was based upon the evidence of various experts, which cannot be better summed up than in the following conclusions of Messrs. Stanger & Blount :—

Ragstone is a natural form of calcium carbonate mixed with siliceous matter. It is an inert substance incapable of setting when gauged with water.

Ragstone when mixed with Portland cement undergoes no chemical change, and does not combine with cement either in the dry state or when the mixture is gauged with water.

Mixtures of ragstone and cement have a specific gravity lower than that of unmixed cement, and indeed correspond closely in specific gravity with that calculated from the respective specific gravities of the two materials. The specific gravity of normal ragstone may be taken as 2·70, and that of normal cement as 3·15, so that the difference between them is substantial.

Save for minor effects caused by the slight slaking action of moisture commonly present in ordinary ragstone, the part played by ragstone mixed with cement is purely mechanical. The product obtained from the two materials is merely a mechanical mixture, and is in no sense a chemical combination. In our opinion such a mixture cannot correctly be termed Portland cement.

Gypsum added to cement for the purpose of regulating the setting time in quantities not exceeding 2 per cent. of the weight of the cement, has no deleterious influence on the quality of the cement.

With respect to other materials, Messrs. Stanger & Blount say that they are unable to give a general opinion as to their influence on cement when mixed with it, and that they would have to report separately as to each after long and careful investigation; and they express a strong opinion in conclusion that whatever be the effects, whether good or bad, of the admixture of any material whatever with Portland cement clinker after calcination, the article so produced cannot legitimately be termed Portland cement. Each of the other experts examined endorsed this view, and the Section approve and adopt it.

We understand that the following firms have signed the declaration proposed by the Chamber of Commerce:—

Arlesey Lime and Portland Cement Company, Limited (Arlesey); Ashby & Son, Limited (London); Barron & Co. (London); Booth & Co., Limited (London); Borstal Manor Cement Company, Limited (Borstal); Burham Brick, Lime and Cement Company, Limited (London); Clitheroe Portland Cement Company, Limited (Clitheroe); Dartford Portland Cement Company, Limited (London); Dix, Green & Co. (Saffron Walden); Earle, Limited (Hull); Formby's Cement Works Company, Limited (London); Francis & Co., Limited (London); Francis, Son & Co., Limited, (Isle of Wight); Gibbs & Co., Limited (London); Globe Portland Cement and Whiting Company, Limited (London); Hilton, Anderson, Brookes & Co., Limited (London); Hooper & Co. (Southampton); Johnson & Co., Limited (London and Newcastle-on-Tyne); Laurence & Wimble (London); Lee, Son & Co. (London); London Portland Cement Company, Limited (London); McLean, Levett & Co., Limited (London); Martin, Earle, & Co., Limited (London); New Rainham Portland Cement Company, Limited (London); Pattrick & Son, (Dovercourt); Peters Bros. (London); Phœnix Portland Cement Company, Limited (London); Ponsonby, Hon. Ashley (Artillery Cement Works, London); Potter & Son (Newcastle-on-Tyne); Queenborough Cement Company (Jaffray & Castle), (London); Richardson, A. & W. T. (London); Robins & Co., Limited (London); Rugby & Newbold Cement Company, Limited (Rugby); Scott, Limited, Walter (Newcastle-on-Tyne); Skelsey's Adamant Company, Limited (Hull); South Wales Portland Cement and Lime Company, Limited (Penarth); Tingey & Son (London); Tower Portland Cement Company, Limited (London); Trechmann, Weekes, & Co., Limited (London and West Hartlepool); Tunnel Portland Cement Company, Limited (London); West Kent Portland Cement Company, Limited (London); Weston & Co. (London); White & Bros., Limited (London); Wouldham Cement Company (London).

DRAWINGS FOR THE PARIS SALON.

IN addition to the particulars we gave recently (page 158 *ante*) in regard to sending drawings for the Paris Salon, we may add, from the official papers of the "Société des Artistes Français" ("Old Salon") which have reached us since then, that each work must have a card attached to it bearing the name of the work and its author on one side, and that the section for which it is intended (painting, architecture, or engraving, &c.) should be indicated on the back of the frame. The artist of the work must also send a memorandum, signed by himself, giving his full name, his nationality, the place and date of his birth,* the name of the artist or artists whose pupil he was, the subjects and dimensions of his works, and his present address. We presume that this letter, like the work, is to be addressed "M. le President de la Société des Artistes Français," but no special statement on this head is made. A printed form for this declaration is issued, a copy of which has been forwarded to us, but there is no statement as to where this is to be had; presumably by application to the secretary of the "Société des Artistes Français." It does not appear, however, that the official printed form is necessary, provided the required information is given.

* This is formally required mainly in reference to the question whether the artist is eligible for certain prizes and "Recompenses" in connexion with the Salon.

BUILDERS' FOREMEN AND CLERKS OF WORKS' INSTITUTION.

THE annual dinner of the Provident Institution of Builders' Foremen and Clerks of Works was held on Saturday last week at the King's Hall, Holborn Restaurant. Mr. William Shepherd, President of the Central Association of Master Builders, occupied the chair, supported by Messrs. Thomas Blashill, A. G. Pridmore, — Strudwick, and about 500 members and friends of the Institution.

The loyal toasts having been honoured,

The Chairman proposed the toast of "The Architects and Surveyors," coupled with the names of Mr. Thomas Blashill and Mr. Strudwick. Having referred to the many new buildings which have been erected in all parts of London and elsewhere from architects' designs, he said that it was quite evident, to any one who observed and compared, that the art of architecture had advanced during the last fifty years. In regard to surveyors, they had made a great position for themselves among professional bodies in London. They had formed a powerful Institution, obtained a charter, and were now building very fine premises in Great George-street, Westminster.

Mr. Blashill, in responding for the architects, said that there was a good deal of difference of opinion amongst architects as to modern architecture, and he was a very fortunate man who was able to please all his professional brethren. All kinds of tastes existed, and he thought it was almost better to attempt something that was striking in design than something that did not interest at all. One character of modern architecture was worthy of notice, and there was a very fair exemplification of it in what he would call the beautiful hall in which they were assembled. There was a durability about the best architectural work, a wealth of colour, good workmanship and material, as well as the interest of the design as a whole. He believed that the time was coming when fire-resisting buildings would be more in demand than they had ever been before; not only in order to avoid the loss of valuable property, which was a secondary consideration, but so as to save human life, and to prevent the recurrence on the newspaper "bills" of such lines as—"Fire in London: Death of two children."

Mr. Strudwick having briefly replied for the surveyors,

Mr. W. H. Sharpington proposed "The Builders and Contractors," and in the course of his remarks he said that there would be no difficulty in getting good and reliable builders and contractors if they could depend upon fair treatment, and if there were no vexatious restrictions put upon them in carrying out a contract. A serious difficulty, which builders would soon have to face, was the Employers' Liability Act, which would, probably, cost the employers a great deal of trouble.

Mr. J. Stapleton then proposed "The Governors, Trustees, Donors, Honorary Subscribers, and Visitors," coupled with the name of Mr. R. Adams, who responded.

The Chairman then gave the toast of the evening, "The Provident Institution of Builders' Foremen and Clerks of Works." The Institution was, he said, doing very useful work, as was proved by the statement in the annual report that during the year 360*l.* had been devoted to the objects of the Institution, which sum, added to past years' accounts, made a grand total of 10,393*l.* disbursed during the fifty-six years of the existence of the Institution. Those who worked for good and useful objects, such as the Institution had in view, could not only command the sympathy but the help of others. He regretted that there were not more employers of labour present that evening, for he thought that, owing to the peculiar relations between the employers and the employed at the present time, it was very important that employers should show their sympathy with their foremen and clerks of works. The masters should assist the men who, in leaving the ranks to become foremen and clerks of works, gave up the benefits obtained from large combinations and societies. Foremen should not be dependent for provident benefits upon the ordinary trade societies. The employment of a builders' foreman was extremely hazardous, and it was the duty of every man in such a position to make some provision for the misfortunes to which he was liable; while, as the success of the employer's operations depended so much upon the reliability and well-being of his foremen and clerks of works, it was to his interest to assist in maintaining the success of the Institution.

Mr. J. W. H. Bedford, in reply, said that 9,695*l.* had been granted in pensions during the last forty-seven years, as follows:—Thirty-two members had received 2,997*l.*; fifty-four widows, 6,275*l.*; and eleven orphans 421*l.*

The other toasts were "The Chairman," proposed by Mr. John Beer; and "The Press," proposed by the Chairman and acknowledged by our representative.

During the evening a list of subscriptions for the coming year was read, the total being 114*l.*, including 21*l.* from the Chairman.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS.

THE second visit of this Association for the season took place on the 26th ult., to Claridge's Hotel, Brook-street, W. The new building, which covers the site of the old hotel, has been erected from the designs of Mr. C. W. Stephens. The interior decoration of the ground floor and part of the first floor was designed and carried out under the supervision of Messrs. Ernest George and Yeates.

The work being within a few weeks of completion, the visit was made more with the view of studying the internal decoration than the architectural treatment of the outside, which is now comparatively well known.

The main entrance from Brook-street is by an interior carriage drive arranged to set down visitors at the vestibule immediately adjoining the winter garden. This occupies the whole of the centre quadrangle, and is covered with a glazed dome. The main feature of the ground floor is the imposing dining-room, which is about 96 ft. by 50 ft., and occupies the greater portion of the west front towards Davies-street. Messrs. George & Yeates have treated this room with inlaid oak panelling, and a plaster arched and enriched vaulted ceiling. The oak work is in most instances carried up to the springing of the arches, with good effect. When finished the dining-room will form a dignified interior.

The smoking-room, with its projecting stove chimney-piece carried up, and beam treatment to the ceiling, is distinctly characteristic of the work and traditions of the architects.

Taking into consideration the sumptuous arrangement of the ground-floor we are a little disappointed with the main staircase which leads up from the west side of the vestibule. It would be invidious to criticise the desirability of the internal carriage drive, but this certainly seems to break up the planning of the Brook-street front, and perhaps for this reason alone the staircase does not possess the monumental appearance we might look for in a building of this description.

The upper floors generally are planned so that three or four rooms form private suites. This may perhaps involve an apparent extravagant use of space in occasional double corridors, but in this particular it may be mentioned that the new building partakes of the private character of the old Claridge's Hotel, which seems to have been one of the requirements of the new scheme.

Upon the first floor at the angle of Brook-street and Davies-street, there is a royal suite of apartments with access from a private staircase and a special entrance. The principal staircases are of white marble throughout. The decoration of the upper floors is very dissimilar from the orthodox hotel decoration, and the treatment Mr. Stephens has adopted is very pleasing. The green paper filling to the corridors was generally admired, and it must be admitted that the dark-stained doors, white paint, and varied tone of some of the rooms is admirable.

HOTEL, BALHAM.—The "Duke of Devonshire Hotel," Balham High-road, has been rebuilt and enlarged. The architect was Mr. Brooker, of London, and the builder is Mr. Young, of Catford.

Books.

The Cathedral Church of Winchester; a Description of its Fabric and a Brief History of the Episcopal See. By PHILIP W. SERGEANT, late Scholar of Trinity College, Oxford. London: George Bell & Sons. 1898.

MR. SERGEANT is to be congratulated on the skilful manner in which he has dealt with the mass of literature relating to Winchester, and on the clear and concise way in which he presents the result to his readers. He is evidently well acquainted with his subject, and also has an unusual command of technical terms, which he applies correctly on the whole, except in writing "groining" when he means "vaulting." His description of the building is complete enough to satisfy the most exacting; and with this book in his hand the student can follow the history and development of the cathedral in the minutest detail. For nothing escapes the author's notice, not even the "suiastika" or "fyefot" on the stole of Bishop Edington's effigy, and those who are interested will find the most valuable possessions in the library duly described.

Moreover, Mr. Sergeant is to be complimented on doing justice to Bishop Edington (not Edingdon, by-the-way); in helping to dissipate the notion that his work was inspired by Wykeham. Careful research has proved the reverse to be the case, and Edington to have been the originator of the Perpendicular style. The author hardly makes it clear that Edington's work did not extend to the clearstory bays; and it might have been stated that it has been thought that he contemplated flanking the west front with flying buttresses. Also, if we may judge by the close analogy between the later windows on the east side of the north transept, and those at Edington Church, Wilts., these were the Bishop's work, too.

We do not see mention made of Canute's great munificence to the cathedral, as recorded by William of Malmesbury; or that the tower, which fell in 1107, appears to have been rebuilt in De Lucy's time, viz.: 1200. *Inchoata est et perfecta Turris Winton. Eccles.* (Aug. Sacr., I., 304). Nor do we find the quaint remarks of a traveller in 1634, who was delighted "with the brave old mother-cathedral, fair and long, and St. George on horseback on the top of her flat-bottomed steeple to be sentinal." This same traveller, by the way, gives some very valuable notes on the stained glass in the Lady Chapel, and elsewhere, viz.: In the Lady Chapel a genealogy of Jesse; in the south aisle a history of the Nativity; and in the north the history of the Revelation.

It was Mr. T. D. (not J. W.) Sedding who made the fine drawing for the restoration of the reredos.

Why does the author consider that Sir George Gilbert Scott's monument to Bishop Wilberforce "is out of place in its Norman surroundings"? Would he have had it Norman, too? And surely the author must know that the pretty idea that an effigy with crossed legs implies a Crusader (in deed or intention) is exploded.

We must again point to the difficulty of reference by including monuments in the general description. Besides other matters, the author deals briefly with "Other Institutions connected with the Cathedral;" including, of course, St. Cross and the College; but why the City Cross, the famous tombstone to Thomas Thetcher, and the West Gate are included under this head it is hard to say.

The views, as usual, are excellent and well chosen, and Britton's fine plates are brought in with advantage. Drawings by H. P. Clifford, an old print, and plates from Willis, Carter, and others add much to the interest of perhaps the best book of the series we have seen. It is a pity the plan does not show the different dates.

An Architect's Experiences: Professional, Artistic, and Theatrical. By ALFRED DARBYSHIRE, F.S.A., F.R.I.B.A. Manchester: J. E. Cornish. 1897.

MR. DARBYSHIRE'S interest in theatres and things theatrical, as well as a general taste for art, beyond the limits of professional interest, and for the society of artists of all classes, have led him to the acquaintance of a great many clever and interesting people, and to an experience of life rather more varied and lively than falls to the lot of all architects. Hence his recollections have afforded him matter for an interesting and readable book, containing a good many personal reminiscences of well-known artists, musicians, and actors, and sprinkled with a good many amusing anecdotes.

Of architecture and architects, in fact, there is a good deal less in the book than might have been expected from its author's profession; but we have no fault to find with it on that score; it is a book written for the general entertainment of the author and the reader, and not for a merely professional circle. Mr. Darbyshire, however, gives us the account of his entrance into architectural study. He was articled to Mr. P. B. Alley, of Manchester, who had entered into partnership with Mr. Richard Lane; the firm of "Lane & Alley" did not suggest high art, but it was, nevertheless, "the local centre of classic thought," and Mr. Lane "was a gentleman and a scholar, whose practice was devoted to an attempt to force upon a commercial nineteenth-century town, with a sunless and humid climate, the refinement and beauty of the art of the Greeks in the Golden Age of Pericles." His pupils did not follow his lead in that sense. Mr. Waterhouse, it is implied, was one of them, and was the first to fall away from the office teaching, and by his success with the Manchester Law Courts to give the great impulse to Gothic architecture in the town. A word of appreciation is devoted to an architect of genius, Mr. Walter, who, like Mr. Lane, had laboured to introduce Classic architecture into the town. "What architectural beauty the streets possess," says the author, "was mainly owing to this man of genius" (which is hardly fair to the architect of the Town Hall). "He used Italian architecture as the means of giving beauty appropriately to the great emporium of the merchant princes. The student who contemplates these warehouse façades will find an open book on Italian Renaissance, full of truth and beauty." During the author's five years of pupilage the office work was prosaic, but lucrative; "we were engaged principally on huge cotton mills . . . we tried hard to give some architectural character to the immense chimney-shafts and engine-house windows." The author's first effort at a bid for fame was to send in a competition design for the Town Hall at Pendleton, in the outskirts of Manchester. He did his best to express his admiration for Gothic architecture, but was advised to send in an alternative Classic design, which was accepted, the Gothic one being nowhere. He observes, "although disappointed, the result taught me a wholesome lesson, namely, that Mediæval architecture required a special treatment to adapt it to nineteenth-century requirements—the sort of treatment, in fact, that it has received at the hands of Waterhouse, whose high reputation is owing to his skilful adaptation of its spirit and beauty to the conditions of the time in which we live."

Among the many artistic, musical, and theatrical reminiscences in the volume, and the good stories told, perhaps the very best is that of the reply of Donizetti when asked if it was really true that Rossini wrote "Il Barbiére" in a fortnight. "It may be quite true," was the answer, "he always was so lazy."

Laxton's Builders' Price Book for 1898.—London: Kelly's Directories, and Simpkin, Marshall, & Co. 1898.

THIS hardy annual, which, we are reminded by the title page, has reached its eighty-first edition, and can, therefore, be considered the parent of price books, again puts in an appearance in the form of a bulky volume of some 1,000 pages.

A price book of the present day, apparently, is not considered complete without a large number of items which, while they are not by any means necessary for the pricing of builders' work (such as a reprint of the London Building Act and other Management Acts, the regulation of the Water Companies, and other matter), add considerably to the value of the book as a work of reference.

The remarks in the *Builder*, p. 59 *ante*, with regard to rate of profit and also as to the special articles, apply also to this work, although we are glad to see that the discount on "Tubes and Fittings," which was there specially mentioned, is given in a footnote.

A short chapter on the "Adaptation of a Price-Book to meet varying rates of Wages" (pp. xxix. and xxx.), is useful, although the result of working on this basis is very approximate, and should only be used when no other means of arriving at the value are at hand. There appears, however, to be a slip in the second paragraph on p. xxx, which was apparently calculated on the basis of labour at 9½d. per hour. If this is not so, the example given is somewhat unhappy, and likely to cause confusion in the mind of anyone attempting to put into practice the rules given.

The working rules for the building trades of London, on page 664, will be found of assistance in dealing with day work.

We are of opinion that the prices for brickwork on page 51 were of sufficient importance to warrant an alteration on account of the increased price of bricks, instead of the somewhat clumsy expedient of pricing the work on the basis of bricks at 5s. per thousand less than the market price, and leaving the reader to calculate the difference in cost. This is all the more unpardonable from the fact that this increase in price is not of recent date, and that the probability of an early reduction is very remote.

The portion dealing directly with pricing—which, by the way, takes up only about a half of the total contents of the volume—will be found very complete, and the prices generally, while claiming to be only for the best work, are not so extravagant as has been the case frequently with price books, and which considerably detracted from their value.

An interesting, if somewhat startling, occupation for an idle hour would be found in the comparison of the prices in the various books; but those who have had the opportunity of comparing the bills of quantities of different contractors for the same work will not, perhaps, be so surprised at the result as those who have not had this opportunity.

A Practical Treatise upon Warming Buildings by Hot Water. By CHARLES HOOD, F.R.S., F.R.A.S. Re-written by Frederick Dye. Third Edition. London: E. & F. N. Spon, Limited. 1897.

MR. DYE has determined to keep this work up to date, and the third new edition contains useful information as to some of the latest advances which have been made in the warming of buildings by low-pressure hot-water systems. The author claims that new systems are explained which have not hitherto appeared in any English book on the subject, and, as far as our acquaintance extends, he is justified in the claim, with the proviso that "English" excludes "American." Although the Americans have originally borrowed from ourselves in matters of heating, there is no question that of late they have repaid the loan, and we have learned from them a good deal, principally from what they have done with low-pressure steam work, which has led to considerable improvements being made in our own methods of warming buildings by hot-water on low-pressure systems. What the Americans call direct and direct-indirect heating are also explained.

In any future edition we should like to see a comparison of some American patterns of boilers, particularly those of sectional type, if it is not unfair to ask this from a manufacturer who may be pardoned if he thinks his own are the best. Even as it is, we must admit, to be honest, that this new edition keeps the standard work on low-pressure hot-water heating in the pre-eminent position which it has attained.

Railway Maximum Rates, Charges, and Traffic Acts. By M. B. COTSWORTH. London: Bemrose & Sons.

PRIOR to the passing of the Railway Rates and Charges Acts of 1891 and 1892, it was simply an impossibility to ascertain how much the railway companies could legally claim for conveyance of merchandise. The old Acts were obscure, and notoriously open to misinterpretation, and presented a tangle that neither the Judges nor the Railway Commissioners could unravel. It is still no easy matter to get at the Parliamentary maximum rates where several different companies are concerned, and here Mr. Cotsworth's little book is calculated to be of material assistance. All the Acts now governing the maximum rates are set forth and explained, together with elaborate scales for all the different classes, arranged and grouped with much ingenuity. Some application is necessary in order to master the detail, but all appears to be presented with as much conciseness as such a complicated subject will allow.

When the first edition of this work was issued, the railway companies were endeavouring to enforce to the full their new charging powers; but, fortunately, they have long since given up that experiment, and are, as a rule, content with a slight advance upon the rates previously in force. However, any one furnished with Mr. Cotsworth's comprehensive scales of charges, may always ascertain whether the companies are keeping within their legal limits.

The Law of Fixtures and Repairs as Between Landlord and Tenant. By W. de Bracy Herbert, Barrister. London: Clement Wilson. 1898.

THIS is an excellent little book, both in substance and form. It is handy in shape, well printed, and the subject of each paragraph is printed in larger type so that each sentence shows at a glance the main subject of it. The author states the law clearly and concisely, and formulates principles in a decisive manner. This is important, for the layman does not desire to grope his way through a mass of reasoning; he wishes to be told definitely what the law on a particular point is. On the whole we regard this as one of the best little handbooks of the kind which has recently come under our notice.

The Workmen's Compensation Act, 1897. With copious Notes. By W. ADDINGTON WILLIS, Barrister-at-Law. Third Edition. Butterworth and Shaw & Sons. 1898.

Handbook on the Workmen's Compensation Act, 1897. By M. ROBERTS-JONES. Fifth Edition. Cardiff: *Western Mail* Office. 1898.

WE have already noticed the previous editions of the first-named work. It may perhaps, however, be desirable to mention that further notes are added to Section 3, which deals with certified schemes of compensation. This will be found very opportune, as the time at which the Act comes into operation (July 1) approaches.

As regards the second of these books, it is convenient and concise, and has evidently already been found useful.

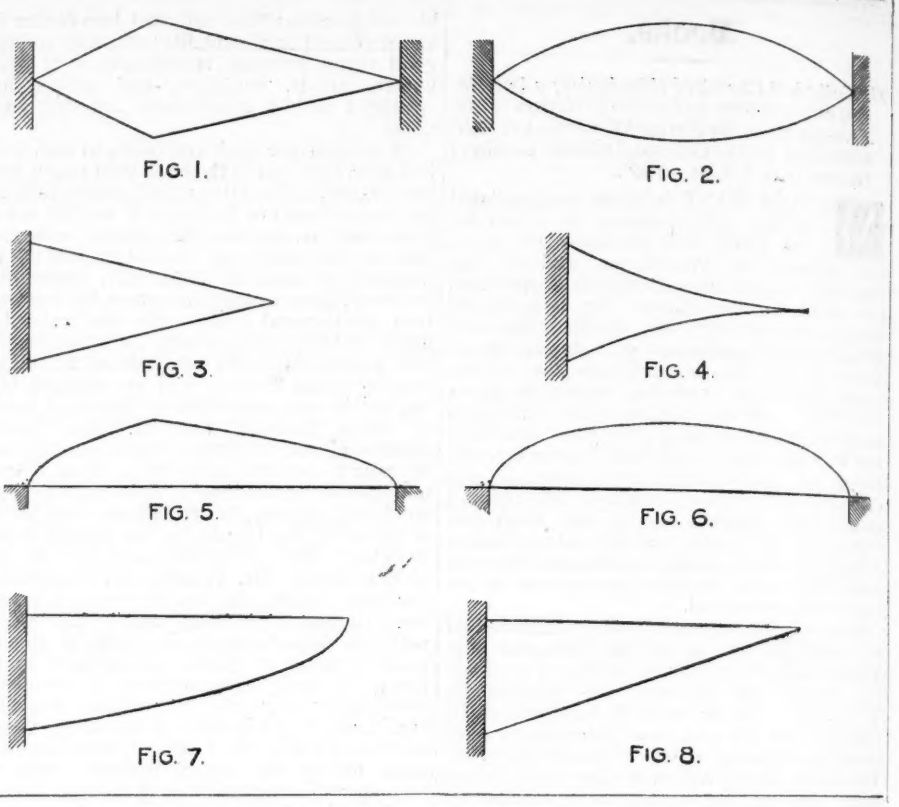
TRADE CATALOGUES.

MESSRS. HAYWARD BROS. & ECKSTEIN send us their illustrated catalogue of improved iron stable fittings, cowhouse fittings, &c. The fittings illustrated are those known as "Cottams" fittings, which are well known to our readers.——Messrs. E. Wood & Co. send us a conveniently arranged card of their steel-plate girders, joist girders, and rolled-steel joists, with sections, and tables of sizes and weight-carrying capacity for various spans from 10 ft. to 38 ft.——The Manchester Laundry Engineering Co. send us a small catalogue of cooking apparatus of various kinds, including also steam boilers, and their "steam reducing valve" for reducing steam pressure to cooking apparatus, &c.——Mr. R. D. Stewart sends us a catalogue of his special materials in paint, varnishes, and painters' plant, including his white lead, of which a chemical analysis is given, numerous colours, varnishes, and brushes; the "Scotch Soap powder" for cleaning down paint and varnish work; and his special red, dry, which we have before noticed. He also sends a specimen of his light portable iron paint-pots, which appear both cheap and durable.——The Consolidated Steel & Wire Co., of New York, send us (through their London agents, Messrs. E. Le Bas & Co.) their illustrated catalogue of "Consolidated Field" wire fencing. The special characteristic of this is that it is made in single thick wires and not in woven strands of small wires, and that allowance is made, by a slight bend at each joint, for expansion and contraction. The patentees claim that it is better than the twisted wires because they get more strength with less weight of wire, and the single wire cannot hold water which would cause rust.

BOOKS RECEIVED.

THE RENAISSANCE IN ITALIAN ART (Handbook for Sculpture and Painting).—By Selwyn Brinton. Simpkin, Marshall & Co.).

MONUMENT TO THE ETTRICK SHEPHERD.—Messrs. John Marshall & Sons, builders, Hawick, have received instructions to erect the monument which the Edinburgh Border Counties Association have resolved to put up at Ettrick Hall, to mark the birthplace of James Hogg, the Ettrick Shepherd. The architect is Mr. Heiton, Perth.



Correspondence.

To the Editor of THE BUILDER.

DORKING WORKHOUSE INFIRMARY COMPETITION.

SIR,—In your criticism on the assessing of the above competition in last week's issue of the *Builder*, you say, "This is a method of procedure which ought to be protested against." . . .

There can be no doubt in the mind of any one giving the question a moment's honest reflection that your opinion is right. But a question of more importance is—"How is this procedure to be protested against with effect?"

Is the protest to come from the unsuccessful competitors (a "crying over spilt milk"), or, is the protest to take a practical form, and come from the leading members of the Royal Institute of British Architects, who, when asked to "assess" a competition in this form, shall have the moral courage to say "No," even at the risk of losing a fee?

The latter seems to me the more reasonable, but I am afraid it is impracticable so long as a Fellow of the Institute is willing to lend himself to such proceeding.

J. ARTHUR SMITH.

*** We entirely agree with our correspondent that anyone asked to act as assessor in a Competition ought to make it a condition that the whole of the drawings sent in should be submitted to him, if he has any reason to suppose that this is not intended. But in this, as in some other similar cases, we do not know whether the assessor was informed of the circumstances or not.—Ed.

The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—X.

THE value of the graphic method of representing moments of rupture lies in the fact that it is equally possible to represent the moment of resistance of a beam by the graphic method; and, therefore, that having drawn the line showing the moment of rupture of the beam at different points, the moment of resistance at those points may be made equal to the moment of rupture; and, therefore, the beam may be made of merely the strength to afford the requisite resistance to the stress at the different points.

In timber beams it is not usual to cut the timber to the form necessary only to give the absolute minimum of strength throughout. A rectangular timber beam is usually made sufficiently strong to do its work where the stress is greatest, and the same section is continued throughout the length of the beam. The greater part of the beam, therefore, has an excess of strength beyond that necessary to resist the proportions of the stress which come upon the various parts. It is, however, very useful to know what the shape would be of beams to resist various stresses supposing they were made of uniform strength, and all superfluous material cut away, and we therefore give some illustrations of the shape of timber beams of uniform strength. But we must ask the student to accept our statement without proof, as the proof demands a knowledge of conic sections, which we assume to be beyond the knowledge of our reader.

Taking, first of all, the shape of beams in which the depth is constant, we have in fig. 1 the plan of a beam of uniform strength with a single load, the widest part of the beam being, of course, at the point where the load is applied; in fig. 2, the plan of a beam of uniform strength with a distributed load; the bounding lines in this case are parabolas with their vertices at the middle of a beam. In the case of cantilevers, the figures are somewhat similar, the plan of a cantilever with the whole load at one end being as fig. 3, and with a distributed load as at fig. 4, where the bounding lines are again parabolas with their vertices at the end of the cantilever. If the breadth is kept uniform, then a beam of uniform strength will have a varying depth which we therefore show in side elevation. A beam with a single load has its edge formed by two parabolas, whose vertices are at the points of support in fig. 5. If the load is distributed, the elevation of the beam is a semi-ellipse, as in fig. 6. So also in the case of cantilevers with a single load; fig. 7 shows the elevation, the lower edge being a parabola with the vertex at the end of the cantilever; and fig. 8 showing the side elevation of cantilever uniformly loaded.

We may now illustrate how in iron or steel beams the graphic method of representing moments of rupture may be applied to determine the minimum size of beams. Taking the moment of rupture or bending moment, illustrated (fig. 2) in our last chapter, to represent the bending moment for which we are to arrange a beam, we will suppose that we are going to support the loads upon the beam by means of a rivetted plate girder. We will suppose that the dimension FM (fig. 9) represents the moment of resistance of such a girder with three plates in the flange, that the dimension FE represents the moment of resistance of the girder with two plates in the flange, and DC the moment of resistance with one plate in the flange; then drawing horizontal lines through M, E and C, where those horizontal lines cut the line representing the bending moment, we have the necessary length of the increased thicknesses of the plates. Thus, OP will be the length where a second plate is necessary, and QR the length where a third plate is necessary.

The student must be careful in dealing with bending moments of distributed loads at any

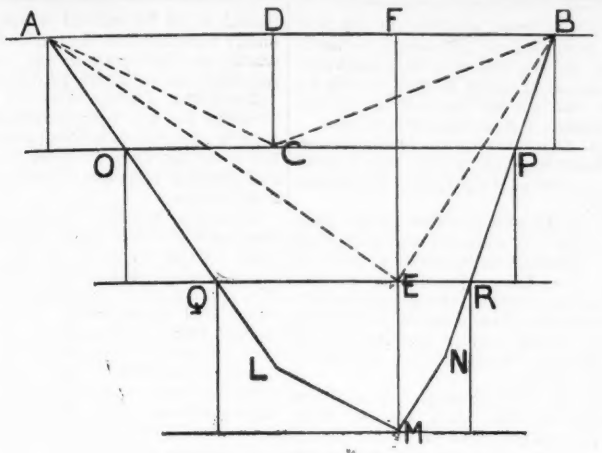


FIG. 9.

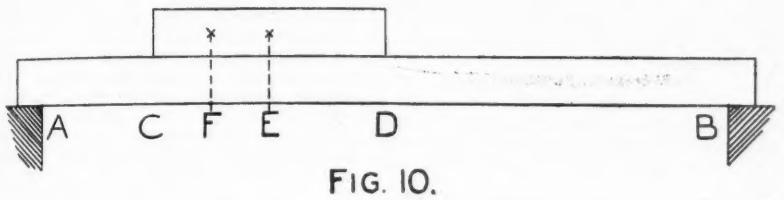


FIG. 10.

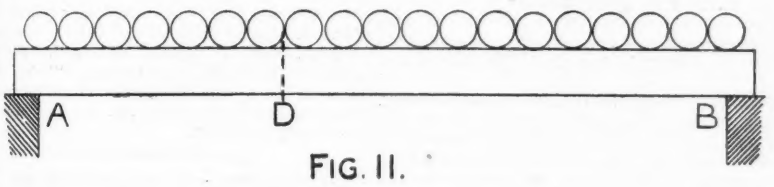


FIG. 11.

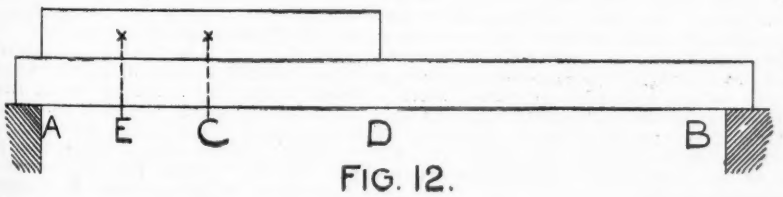


FIG. 12.

particular point. Let us just consider this in detail. In the diagram (fig. 10) we will suppose AB to represent a beam with a distributed load from C to D, of which the centre of gravity is at E; the reaction of the supports A and B will be in proportion to the load which they sustain, as already explained. Then the forces which are acting about the point E, taking one side only for the sake of simplicity, are the reaction R_1 at A in an upward vertical direction, the moment of which is $R_1 \times AE$, and opposing this a portion of the weight between C and E, acting downward at its centre of gravity F, and its moment about E is its weight $W_1 \times FE$. So that the moment of rupture at E is $(R_1 \times AE) - W_1 \times FE)$.

Thus in the case of an evenly distributed load over the whole length of the beam, the greatest moment of rupture is at the centre of the beam and is equal to half the load, multiplied by half the span minus half the load multiplied by a quarter the span or half the load multiplied by a quarter the span. At any other point D (Fig. 11) the moment equals half the load on AD, multiplied by DB or half the load on DB, multiplied by AD. Thus it will be seen that generally the moment at any point is equal to half what it would be at that point if the whole load were there concentrated.

In the case of a uniform load extending from a support over part of the beam, as in fig. 12, the centre of gravity, C, of the load must be first found, and then the reactions on the supports A and B, then the moment of rupture at D, or at any point between D and B, is equal to the reaction at B, multiplied by the distance from D, or any other point which is taken between D and B. At any point E, between A and D, the moment of rupture is equal to the reaction at B multiplied by BE, minus the load on ED, multiplied by half ED, or to the reaction at A multiplied by AE, minus the load on AE, multiplied by half AE.

OBITUARY.

M. PETITGRAND.—A very able French architect, M. Victor Petitgrand, has just died at the age of 56, after a long and painful illness. He was a former pupil of Baudot, and was for many years attached to the Service of "Monuments Historiques," under which he had charge successively of the monuments in the department of Puy de Dôme, Haute Garronne, la Manche, and Haute Loire. Among the most important of his works was the restoration of the cathedral of Puy-en-Velay and its fortress-like cloisters. He had also restored the roofs of the church of Chaise-Dieu, and at the time he was taken ill he was just completing, at Mont St. Michel, the work begun by M. Corroyer. The portion which was his special work there was the refectory, and the rebuilding of the tower over the crossing. In 1896 the Société Centrale des Architectes awarded him a medal for his studies of French architectural monuments. He obtained also a gold medal at the exhibition of 1889. M. Petitgrand was universally esteemed both for his talents and high character. In England, of course, his works of restoration mentioned above would be regarded by many in a very different light from that in which they are regarded in France; but one must estimate the work of a French restoring architect from the French point of view, and there is no doubt that M. Petitgrand was one of the ablest of contemporary architects of that school.

MR. A. ALLAN.—Mr. Archibald Allan, C.E., Burgh Surveyor for Govan, died suddenly at his office, Hillock House, on the 23rd ult. Deceased was a native of Glasgow, and was appointed Burgh Surveyor of Govan in 1880.

MR. E. J. PURNELL.—The death took place on Sunday last, at his residence, in Coventry, of Mr. E. J. Purnell, jun., architect and surveyor.

MR. CHARLES W. CAMPION.—The death has just taken place of Mr. Charles W. Campion, architect and surveyor, of Neath. He had lived at Neath for the last forty years. Until the formation of the District Council took place he occupied the position of Surveyor to the Highway Board of the Neath Union.

GENERAL BUILDING NEWS.

CHURCH, BISHOPTHORPE, YORKSHIRE.—A new church is being erected at Bishopthorpe. The nave, chancel, aisles, and vestry will be built at once. It is hoped, as soon as possible, to proceed with the tower, choir vestry, south chapel, and porch. The architect is Mr. Hodgson Fowler, and the contract is being carried out by Messrs. Bowman & Sons, of Stamford.

RESTORATION OF MELDRETH CHURCH, NEAR BEDFORD.—The parish church of Meldreth has just been reopened after restoration. The contractors were Messrs. Shillitoe & Son, of Bury St. Edmunds, Mr. F. L. Pearson, of London, being the architect.

RESTORATION OF THE PARISH CHURCH, WELLINGTON, SALOP.—It is stated that Wellington Church will be closed after Easter Sunday for restoration. The architect will be Mr. C. R. Dagleish, of Wellington, with Sir Arthur W. Blomfield, A.R.A., as consulting architect.

ENLARGEMENT OF TADCASTER PARISH CHURCH.—A north aisle has just been added to the Church of St. Mary, Tadcaster. The extension has been carried out from plans prepared by Messrs. Bromet & Thorman, architects, of Tadcaster, and the addition provides extra accommodation for about eighty worshippers. In the west end is a five-light window, filled with cathedral glass. The stained glass in the memorial windows in the north wall was taken out and replaced. The contractors' work has been carried out by Messrs. W. Thomson & Son, of Sherburn-in-Elmet. The vestry screen was designed by Mr. Thorman, and has been carved by Mr. George Milburn, of York.

IMPROVEMENTS, STAVERTON CHURCH, NORTHAMPTONSHIRE.—Some improvements in this church have been carried out as a memorial of her Majesty's Jubilee. It was decided that a screen should be placed in the tower arch, and Mr. Townsend, of Peterborough, who was the architect for the restoration of the church some few years ago, was commissioned to design the screen, which has been erected by Mr. Neale, contractor, of Daventry. A further improvement has been made in the church by the insertion of a memorial window on the south wall of the nave. The glass is by Messrs. Heaton, Butler, & Bayne.

PRIMITIVE METHODIST CHAPEL, BRADLEY, YORKSHIRE.—A new Primitive Methodist chapel has just been opened at Bradley. The dimensions of the interior of the chapel, which is reached by a flight of stone steps, are 38 ft. 6 in. long by 31 ft. wide, and the height is 15 ft. 6 in. The schoolroom, which has a length of 30 ft., a breadth of 20 ft., and a height of 14 ft., is situate behind the chapel. There are three vestries. Mr. J. Hartley, Skipton, has been the architect, and the contractors were as follows:—Masonry, Mr. Thomas Atkinson, Eastburn; joiner, Mr. Thomas Green, Farnhill; plumber, Mr. Isaac Wilson, Crosshills; painter, Mr. Robert Petty, Crosshills; plasterer, Mr. John Greenwood, Crosshills; slater, Mr. Thomas Throup, Bradley. The cost of the buildings has been about 1,550*l*.

BAPTIST CHURCH, LOWESTOFT.—The foundation stones were laid recently of the new Baptist Church, on London-road, Lowestoft. The new building is Gothic in style and provides accommodation for nearly 700 persons. A gallery has been provided at the front end of the building. The seats are arranged on a semi-circular plan. There will be a nave and aisles, divided by red granite columns with carved stone caps, moulded stone bases; brick arches and clearstory windows above. Two vestries are provided on the ground floor, and a classroom over the south-west lobby, with cloak-room beneath. The internal dimensions of the chapel are: width, 49 ft.; length, 74 ft. The architect was Mr. George Baines, of London.

CONGREGATIONAL CHURCH, WHITTINGTON, SALOP.—The Congregational Church which has been erected at Whittington was opened recently. The architect was Mr. Williams, Liverpool, while the work has been carried out by Messrs. Griffiths & Son, of Ellesmere and Knockin. The building, which has a frontage to the Holyhead-road, is in the Gothic style, and is of red Sweeney brick, with dressings of terra-cotta. It is 40 ft. 6 in. long by 27 ft. wide, and will seat about 180 persons. The heating is by hot-water pipes. A vestry, with other out-offices, is attached; while in the rear space is left for the erection of a schoolroom.

UNITED PRESBYTERIAN CHURCH, CAMBUSLANG.—On the 26th ult. the memorial stone of the new United Presbyterian Church, presently in course of erection at Rossbank Grounds, West End, Cambuslang, was laid. The edifice is being erected from plans prepared by Mr. William Ferguson, architect.

Glasgow. The building will be of red sandstone, and will be provided with side and end galleries. Behind the pulpit there is a recess as an organ chamber, which will be lighted by a large window. Three stone arches and piers divide the recess from the church, while the arches at the side gallery are also of stone. The front entrance, which faces the main street, has a porch giving entrance into the vestibule, with a cloak-room at one end and an exit door at the other. There are also exit doors at the pulpit end of the church, communicating with the halls, vestry, &c. The halls are three in number. The entire cost of the building is estimated at 7,200*l.*

CATHOLIC CHURCH, GILLINGHAM, NORFOLK.—The foundation stone of a new Catholic Church, dedicated to Our Lady of Perpetual Succour, was laid at Gillingham recently. The dimensions of the building are 76 ft. in length, 22 ft. in width, with campanile 60 ft. high. The church will not be completed at present, the work in hand including sanctuary, sacristy, confessional, lobby, and part of the nave. The building has been designed by Mr. F. E. Banham, architect, the builders being Mr. J. Allen's executors, contractors, Beccles.

CHURCH OF THE HOLY ROSARY, BALLYNAFEIGH, BELFAST.—The walls of the new Church of the Holy Rosary, Ballynafeigh, are now completed, and the structure is being roofed. The contractors are Messrs. H. & J. Martin, and the architects, Messrs. J. J. O'Shea and E. & J. Byrne. The church is being built throughout of Scrabo stone.

SCHOOL FOR GIRLS, CONWAY. — The Lord-Lieutenant of Carnarvonshire (Mr. J. E. Greaves) opened a new girls' school at Conway, on the 21st ult., as a department of the National Schools. Messrs. Grierson & Son, Liverpool, were the architects, and Messrs. Parry & Son, Llandudno Junction, the contractors. There is accommodation for 160 girls, divided into a main classroom, cookery-room, and lavatory.

ADDITIONS TO THE STATIONERS' COMPANY'S SCHOOL, HORNSEY.—It has been decided to add another wing and make other improvements to this school. The new wing will provide six additional classrooms, a chemical laboratory, a physical laboratory, and a carpenter's shop. Accommodation will be provided for upwards of 150 additional pupils. Mr. Gordon Stanham, the company's architect, will supervise the works of extension and improvements.

NEW SCHOOLS, KINSON, NEAR BOURNEMOUTH.—An addition has just been made to the present buildings at Heatherlands, for the Kinson School Board. The floor is laid with wooden blocks. The rooms are heated with hot-water pipes, this part of the work being done by Messrs. W. J. Bacon & Co., of Poole. Adjoining the schoolrooms are the cloak lobbies. The total cost of the new building is about 1,250*l.*, and the work has been carried out by the contractor, Mr. F. Elcock, of Pokesdown, the architect being Mr. S. J. Newman, of Branksome.

PARISH INSTITUTE, COCKINGTON, TORQUAY.—It is proposed to erect a Parish Institute at Cockington. The site selected for the building is in the Sherwill-road, adjoining the National schools. The plans have been prepared by Mr. Rowell, architect, of Newton Abbot.

VOLUNTEER DRILL HALL, BLAIRGOWRIE.—On the 18th ult. a new Volunteer drill hall was opened at Blairgowrie for C company, 5th Volunteer Battalion Royal Highlanders. The building is situated in Union-street, and comprises a drill hall, 60 ft. by 40 ft., armoury, rooms for officers and men, lavatories, &c. The plans were prepared by Mr. Robert Reid, Blairgowrie.

LIBERAL CLUB, ALLERTON, YORKSHIRE. — The new Liberal Club at Allerton is situated in the Allerton-road. The building contains on the ground floor a committee-room, a card-room, and a reading-room. The reading-room and card-room are divided by folding doors, so that when necessary they can be converted into one large room, 32 ft. by 15 ft. From the entrance hall a staircase gives access to the first floor, occupied by the billiard-room, a bath-room, and other conveniences. At the rear of the club is the caretaker's house. Messrs. Fairbank & Wall, Bradford, were the architects, and the work has been carried out under their supervision. The following were the contractors:—Mason, Mr. Thomas Haigh; joiner, Mr. John Foster; plumbers, Messrs. Haigh & Slater; plasterers, Messrs. J. Drake & Son; slaters, Messrs. Hill & Nelson; painters, Mr. Walker Priestley.

PROPOSED EXTENSION OF TECHNICAL SCHOOL, DEWSBURY.—Plans for the proposed enlargement of the Dewsbury and District Technical School are being prepared by Mr. J. Lane Fox, architect, Dewsbury. The school, when enlarged, will have an additional frontage to Carlton-road of 69 ft.

CONSERVATIVE CLUB, NUNEATON.—A new Conservative club is being erected in Nuneaton, at the corner of Bond-street and New Bridge-street. The architect is Mr. Charles W. Smith, Grantham, and the contract has been secured by Mr. Thomas Smith, of Chilvers Coton, whose tender amounted to 5,126*l.*

ADDITIONS TO DUNBLANE HYDROPATHIC.—It has been decided to enlarge this establishment. A new wing will be added to the north end of the building adjoining, and the existing dining-room accommodation will be increased. The increased accommodation will afford room for nearly 100 persons additional. In the basement, underneath the new dining-room, is a servants' hall and a large servants' dormitory. Plans for the extension have been prepared by Messrs. James M'Laren & Sons, architects, Dundee, while the contract for the mason work has been secured by Messrs. J. & C. Hay, of Dundee.

STATION HOTEL IMPROVEMENTS, INVERNESS.—Alterations are being carried out at the Station hotel, at Inverness, from plans prepared by Messrs. Ross and Macbeth.

NURSES' HOME, SHOREDITCH.—The nurses' new home at the Shoreditch Workhouse Infirmary was opened recently. The building has been erected at a cost of 12,500*l.* The home immediately adjoins the workhouse, and the buildings are connected by means of a glass arcade. The home is four stories high, and contains sixty rooms, accommodating seventy nurses. The architect is Mr. F. J. Smith, and the builder Mr. J. Steed.

NEW FIRE STATION, BRENTFORD.— A new fire station for Brentford has just been opened. It is situated in the High-street, and is of red brick, with white stone dressings. On the first floor is a room for the use of firemen, for inquests, &c., and also the living-rooms for the resident engineer. At the side is an escape station and hose drying-ground. The plans were prepared by Mr. Nowell Parr, Town Surveyor, and the work has been executed by Mr. J. Barnes, of Brentford.

BUILDING IN FLEETWOOD, LANCASHIRE.—The monthly meeting of the Building Plans Committee of the Fleetwood Town Council was held on the 23rd ult. at the Town Hall, when seventy plans were submitted; forty were approved and thirty disapproved.

BUILDING IN ABERDEEN.—A meeting of the Plans Committee of the Aberdeen Town Council was held on the 24th ult., when a large number of plans of new buildings were submitted and passed. These included plans for thirty-one dwelling-houses, of which twenty-nine are to be erected in Great Northern-road. The Committee had under consideration, on a representation by the Trades Council, the question of appointing an inspector to prevent jerry-building in the city. The matter was deferred.

PROPOSED COTTAGE HOMES, ST. OLAVE'S UNION.—At the recent fortnightly meeting of the St. Olave's Board of Guardians, the Special Committee appointed with reference to the provision of school accommodation for the Union, in consequence of the dissolution of the South Metropolitan School District, reported having visited the cottage home schools at Bridgend, Banstead, Hornchurch, and Croydon. The Committee recommended that schools be erected to accommodate 600 children on the system of the semi-detached cottage homes of the Croydon Union, each cottage to provide for fifteen children. The Committee also recommended that provision be made for workshops to impart technical instruction, an assembly-hall, schoolrooms and class-rooms, an infirmary, stores, a laundry, a swimming bath, a gymnasium, probation wards, a bakehouse, administrative buildings, &c.; and that Mr. A. H. Newman (the Board's Architect) be instructed to prepare the necessary plans. On the motion of Mr. Ecroyd, the Committee's recommendations were adopted.

ADDITIONS TO INFIRMARY, LIVERPOOL.—About four years ago a new infirmary was erected in Smithdown-road, in the Toxeth district, under the superintendence of Messrs. C. O. Ellison & Son, architects. During the course of erection the Guardians further decided to extend the boiler power so as to suit the entire establishment; a boiler-house and large chimney were added, and the whole (excepting three delayed pavilions) was completed at a cost amounting to some 34,000*l.* The deferred pavilions have now been completed by the same contractors, Messrs. Kelly Brothers, of Walton. The reception block and vagrants' wards are situated within a few yards of Smithdown-road, allowing of the vagrants using their department without entering the main premises, and giving the porter absolute supervision thereof. Waiting-rooms and dormitories are provided in the reception block, together with baths and all sanitary arrangements, disinfector, and store for inmates' clothing. Further south, and fronting the gardens and the cemetery, is the nurses' home, with accommodation for thirty nurses, each having her own bedroom, with general sitting-room, and room for the reception of visitors. Sitting and bed rooms, bath, &c., are provided *en suite* for the lady superintendent, kitchen arrangements, bedrooms for domestics, baths, lavatories, and box-rooms. From the reception block a corridor gives direct access to each pavilion, and lifts are provided by which bedridden inmates can be taken to or from the upper floor. The pavilions, placed *en echelon*, are entered from each side of the corridor respectively. Each ward has a large central open fire-stove, with hot pipes in addition, and at the ends are nurses' rooms, day-rooms, special wards, baths, lavatories, &c. An operating-room is provided, having a north light, ante-room, and wards for men and women, and is in the centre of the institution. An opthalmic room is also provided. The administration block is centrally situated, and in direct communication with every ward. It includes enamelled brick-lined kitchen, scullery, pantry, and stores, a dining-room for the staff, dispensary, and rooms for the lady superintendents and doctors. Everything is so placed as to be central whenever the infirmary is finally completed by the rebuilding of the women's wards, the infirmary so far being for men only. Accommodation is now provided for 420 inmates.

PREMISES, LAUNCESTON.—A block of buildings intended for the new premises of the Launceston Liberal Association is being erected under the supervision of Mr. Otho B. Peter, architect, Launceston, and Messrs. Broad & Warren, of Launceston, are the builders.

MEETING-HOUSE, LLANDRINDOD WELLS.—A meeting-house has been erected at Llandrindod Wells for the Society of Friends. It is constructed of red Ruabon facing bricks, with Cefn stone quoins, sills, and cornices. The roof is covered with Bangor slates, and ridged with red Ruabon crests. The meeting-house is lighted by means of electricity. The plans were supplied, it is stated, by Messrs. Owen M. Roberts & Son, of Portmadoc, and the work has been carried out by Mr. E. H. Williams, of Llanbrynmair, under the superintendence of Mr. E. P. Morris, of Llandrindod Wells.

PREMISES, BURTON-ON-TRENT. — Premises in High-street, Burton-on-Trent, are being remodelled and enlarged for Messrs. Worthington & Sons, wine and spirit merchants. Mr. Thomas Jenkins, of Burton-on-Trent, is the architect for the work, the contractors being Messrs. T. Lowe & Sons.

NEW RESIDENCE, STONEHAVEN.—A large granite house has just been completed here. It is for an English gentleman, to be used as his summer residence. It is in the Scottish Baronial style of architecture, the south and west elevations (which are the exposed ones) being built in Kemnay granite, and the ashlar rock-faced, with fine picked dressings. The roof is covered with Tilberthwaite green slates. The inside finishings are all of American poplar, except the staircase, which is of pitch pine. The following contractors have carried out the various works:—Mason's work, Mr. George Gregory, Stonehaven; carpenter's work, Messrs. R. Thomson & Sons, Stonehaven; slater's work, Mr. Charles Maitland, Aberdeen; plumber's work, Mr. A. Mathieson, Stonehaven; plaster work, Messrs. Scott & Sellar, Aberdeen; painter's and glazier's work, Messrs. Barron & Son, Aberdeen. The building was designed and carried out under the superintendence of Mr. J. Augustus Souttar, architect, Aberdeen.

SANITARY AND ENGINEERING NEWS.

MIDSOMER NORTON SEWAGE WORKS.—The new sewage works constructed by the Midsomer Norton Urban District Council were formally opened on the 12th ult. by the Chairman. The purification process adopted is that of precipitation by chemicals followed by filtration. The sewage, on entering the works, passes through a straining grating, and then through a scum and detritus chamber. The precipitant Ferozone is next added by means of a Keirby mixer, the motive power of which is a small water-wheel worked by a portion of the river water. After the precipitant is added, the sewage passes over a series of iron baffles, thoroughly mixing the chemical with the sewage, which then enters the first "Candy" circular precipitation tank (16 ft. in diameter by 10 ft. 6 in. deep) at the bottom by a series of vertical inlet pipes, and is discharged from the top by wood collecting channels. The sludge is removed from the tank daily by means of a revolving steel arm, and is run on to prepared and drained sludge lagoons, where it is dried and afterwards removed for use as manure. After leaving the tank the sewage is passed through another of similar size and design, and it is believed the present instance is the only one where duplication of tanks has been carried out, the engineer, Mr. F. Bird, claiming that by this means a better effluent is produced at a reduced consumption of chemicals. After leaving the "Candy" tanks, the sewage passes on to filter-beds.

WATER SUPPLY, ALLENDALE TOWN, NORTHUMBERLAND.—The new water supply for Allendale Town was publicly opened on the 19th ult. The new supply is brought a distance of about a mile and a half, from a spring on the Park Gates Farm, in a 3-in. main. A storage reservoir, to hold about thirty thousand gallons, forms part of the scheme, but remains to be completed. The work has been carried out by Mr. W. Carr, contractor, Hexham, according to plans prepared by Mr. M. Waugh, Surveyor to the Rural District Council.

DOUGLAS SEWERAGE SCHEME.—The committee of the Manx Legislature appointed in the matter of the application of Douglas Corporation for power to borrow 20,000*l.*, in addition to 35,000*l.* already authorised, for the improvement of Douglas sewerage, sat on the 23rd ult. The application was opposed by a number of ratepayers, who objected to the mechanical system proposed. Mr. E. H. Stevenson, engineer, London, author of the scheme, admitted that the only reason that existed for the mechanical system was that certain basements were below the tidal level. If these were not to be drained, the gravitation system would be better and cheaper. The inquiry was adjourned, to allow of the gravitation scheme being submitted.—*Liverpool Mercury.*

LOCAL SEWERS IN LONDON.—The Main Drainage Committee of the London County Council has agreed, subject to a condition recommended by the Engineer, to the construction of the following local

sewers :—Lewisham — 100 ft. of 12-in. pipe and concrete sewer in Cudham-street. Wandsworth—1,040 ft. of 12-in. pipe and concrete-sewer in Blegborough-road ; 460 ft. of 18-in., 435 ft. of 15 -in., and 370 ft. of 12-in. ditto in Falsbrook-road ; 830 ft. of 15-in., 450 ft. of 12-in., and 5,790 ft. of 9-in. pipe and concrete sewers in Aylsham-street, Creedenhill-street, Cunliff-street, Eastwood-street, Falsbrook-road, Fernthorpe-road, Gorsehill-street, Kettering-street, and Penrith-street, Furzedown Park Estate, Mitcham-lane, Streatham, for surface-water only ; and 270 ft. of 9-in. pipe sewer in Cross-road, Clapham Common. Whitechapel—650 ft. of 12-in. pipe and concrete sewer in Underwood-street, Vallance-road.

HARBOUR EXTENSION, INVERNESS. — On the 23rd ult. a meeting of the Trustees of Inverness Harbour was held for the special purpose of considering the various schemes for the extension and improvement of the harbour, wharfage, and approaches recommended by Messrs. D. & T. Stevenson, C.E., Edinburgh, and Mr. James Fraser, C.E., Inverness. The first scheme recommended by Mr. Fraser involved an expenditure of 34,270*l.*, but as this sum was considered too great, the engineer was asked to submit a modified scheme, leaving out such items as might be delayed. This revised scheme recommended work to the cost of 21,650*l.* to be done. After considerable discussion, it was moved that the Trust secure the services of a consulting engineer experienced in river harbour works to aid them in coming to a decision, recommending Mr. Deas, Consulting Engineer to the Clyde Navigation Commissioners. Bailie Macdonald moved as an amendment that three of the recommended items, entailing an expenditure of 9,300*l.*, be proceeded with ; but on a division the motion was carried by 9 votes to 4.

SUTTON-IN-ASHFIELD SEWAGE WORKS.—The new sewage works constructed by the Sutton-in-Ashfield Urban District Council, from plans and specifications prepared by their Surveyor, Mr. W. McBishop, were opened on the 21st ult. The works have been utilised for some months, and were constructed at a cost of over 7,000*l.* The contractors were Messrs. Lane & Son, of Skegby. The process adopted is that known as the "International." The dry weather flow is about 260,000 gallons per day, and of a highly concentrated character.

STAINED GLASS AND DECORATION.

WINDOW, PARISH CHURCH, WEST LYDFORD.—A stained-glass window has been inserted in the south side of the parish church, West Lydford, near the porch, to the memory of the late Dr. Culling. The window is of three lights. It was supplied and executed by Messrs. Frederick Drake & Sons, of Exeter.

NEW WINDOWS AND REREDOS, ST. JOHN'S CHURCH, BARNSLEY. — Two new stained glass windows and a reredos, placed in the chancel of St. John's, Barnsley, were dedicated recently. The new windows depict, one the Crucifixion, the other the Resurrection of Christ. The windows are of three lights, and the reredos is of carved oak. The windows are by Messrs. Percy Bacon Bros., London ; the reredos by Mr. Hedley, of Newcastle.

FOREIGN.

FRANCE.—M. Larroumet has been appointed permanent Secretary to the Academie des Beaux Arts in the place of Comte Delaborde. The new Secretary has been successively Professor of Rhetoric at the Lycée Henri IV., Directeur des Beaux Arts, and Professor of French Literature at the Sorbonne.——There is talk of erecting a monument to the poet Paul Verlaine in the Luxembourg gardens, near the Medicis fountain, consisting of a bronze bust of the poet, mounted on a stele and surrounded by allegorical figures. M. Niederhausen-Rodo is to be the sculptor.——The municipality of Versailles have voted a considerable sum for new works, including the restoration of the Hôtel de Ville and the erection of a hospital.——The municipality of Besançon have opened a competition for the restoration and enlargement of the Hôtel de Ville.——M. Injalbert, the sculptor, is just completing a group of monumental dimensions for the theatre at Orange.

GERMANY AND AUSTRIA.—660 mètres length of new waterpipes are to be laid in Vienna at a cost of 4,000 florins.——The town council of Graz are taking steps for acquiring sites on which to erect new schools, the necessity for which has been pointed out by the municipal school inspector.——A deputation of the restoration committee of St. Agnes' Convent, Prague, has submitted the plans to the Mayor for the approval of the Council of the city. The architect is Herr Anton Cechner, and the estimated cost 169,000 florins——The Protestants of Komotau have secured the finest site in the town for their new church, for the sum of 200 florins, payable in twenty annual instalments ! The church is to be Gothic in style ; the building will be commenced this year.——A girls' school, with chapel, is to be built at Chrudim, in commemoration of the Jubilee of the Austrian Emperor.——The Moravian Landtag have purchased for 65,000 florins a house in Brünn, to be adapted as a Gendarmerie barrack.——The Reformed congregation at Steinbruch has, after long efforts, succeeded in raising enough money to build its new church, and intends to set about the work in the spring.——A site has been granted for a Technical Institute at Buda Pesth, and another for a Museum of Fine Art, provided the original scope of the museum be not departed from.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The Vulcan Boiler and General Insurance Company, Limited, has removed the London branch of its offices from 77, King William-street to 3, Eastcheap, E.C.

DUBLIN MASTER BUILDERS' ASSOCIATION.—On the 19th ult., the annual dinner of the Dublin Master Builders' Association was held at Jury's Hotel. The company numbered about ninety, and the Right Hon. J. M. Meade, LL.D., President of the Association, occupied the chair. The loyal toast having been honoured, the High Sheriff proposed "The Master Builders' Association." It was a sound principle, he said, that that Association recognised in the fullest sense that the employer had his duties as well as his rights, and that when an employé gave an honest day's work he would get a fair wage. The Chairman, in replying, said their Association dated back for some years, but, in the course of time, it became moribund until, in the stress of circumstances, having to face a large strike that took place two years ago, it was found necessary by the builders of Dublin to resuscitate the Association and bring it into active work. The resuscitation of the Association was not only for the benefit of the master builders, but also the workmen, because every member of the Masters' Association, when he got a fair day's work, was prepared to pay the full rate of wages that could be obtained in the district at the time. As to their progress during the past year they had nothing to report. They had had no difficulties with their men, and that was something to be thankful for. They never had had any difficulties with the architects. He was sure there would be no difficulty in settling any difference that would arise between any architect in Dublin and members of the Master Builders' Association. He then proposed the toast of "The Royal Institute of the Architects of Ireland" and the "Architectural Association of Ireland." In no city in the empire could that toast be proposed with more appropriateness than in Dublin, because both in their city and country evidences were numerous of the skill of the architects who went before them. Taking their city itself, they had those two old cathedrals, built some centuries since —monuments to the architectural designing of their forefathers and to the builders who carried out the work. Coming to the end of the last century, they found the city studded with magnificent buildings, but when they came to the present he made bold to say that they had nothing to be ashamed of. The numerous buildings that had been erected within the last fifty years in Dublin—churches, banks, and private dwellings—were worthy to rank with the best creations of their forefathers. He pointed to the Museum and groups of buildings in College Green, and remarked that, taking all things into consideration, these were worthy of the genius of the Irish race. When they looked at the architect of to-day and saw what he was called upon to do, and considered what the architect had to do in days gone by, they would see a vast difference. In the old days the architect superintended one building for two or three years, and saw that every window and door in it was properly erected. In the present day a client came to an architect and said he wanted a building—a theatre, for instance—capable of accommodating 2,000 persons, all the arrangements to be perfect, and the designs to be prepared and the building put in the tradesmen's hands and completed probably in twelve months from the time the client first saw the architect. In the old days an architect would say that was impossible. He coupled with the toast the names of Messrs. Mitchell, Parry, and Orpen.—Mr. Mitchell, in reply, said their Institute was not only a metropolitan society, but it had a strong following in Belfast, Cork, and all the country towns, and it was now allied with the Royal Institute of British Architects. Owing to their increasing numbers they had recently taken rooms of their own, so that in future they would have an architectural home in Dublin that would enable them to carry out many reforms they were not able to effect before.—Mr. Parry thought Irish architects had no reason to be ashamed of the position they held collectively as an Institute compared with their professional brethren in England. Much better fellowship existed amongst them in Ireland than in England.—Mr. Orpen also responded.—The Chairman said he had now a very pleasing duty to perform, and that was to make the presentation of a silver salver, teapot, and stand to their Hon. Sec., Mr. John Good, on behalf of the Association, in honour of his marriage, and in appreciation of his service to the Association.—Mr. Good suitably replied.—Mr. Lidwell proposed the toast of "Our Guests," and the High Sheriff and Mr. C. Dawson responded.

THE LONDON COUNTY COUNCIL AND THE WORKS DEPARTMENT.—The referee's award in the action between James Miller (plaintiff) and the London County Council (defendants), remitted by order of Mr. Justice Hawkins from the Queen's Bench Division to Mr. Herbert Thomas Steward, architect and surveyor, of 45, Parliament-street, was received on the 24th ult. Litigation in the case has been pending since 1895. The plaintiff in the action is the owner of a number of small cottages in Miller's-avenue, Stoke Newington-road. At the rear of these cottages, and on a much lower level, was a building which had been decreed as dangerous by the County Council officials. The case for the plaintiff was that the County Council sent their workmen from the Works Department and altogether demolished the alleged dangerous structure. In doing so they removed a portion of a wall which had hitherto held up the higher land at its back, and plaintiff's cottages were then in danger of falling down. To make the damage good the plaintiff had to build a new wall, and he called on the County Council to recompense him for the cost he had been put to. As they declined to pay he brought an action for damages. The referee awarded the plaintiff 17*l.* 10s., and directed the defendants to pay the plaintiff his costs of the law action, including the costs of the reference and also the referee's fees and the costs of his award. The fees and the costs of the award were assessed at 65*l.* 9s. 6d. There were several counsel engaged in the case and twenty-nine witnesses.—*Times.*

APPRENTICESHIP.—In the Chancery Division of the High Court of Justice an application was recently made that the apprenticeship deed of a ward of Court should be settled by the Plumbers' Company, and a form drawn up by the Company has been approved by the judge, Mr. Justice Romer. In addition to the usual provisions based on the indenture for apprentices in the City of London, approved by resolution of the Court of Common Council, April, 1889, special covenants were inserted "binding the apprentice to diligently attend evening classes of technical instruction as directed by the master, under penalty of a reduction in wages, and binding the master to provide for attendance of the apprentice at the courses of instruction, and the examination in knowledge of sanitary plumbing and workmanship prescribed by the Plumbers' Company, or any statutory body empowered to keep a register of qualified plumbers." These covenants were introduced with the object of encouraging and promoting the apprentice's efficiency, and are novel in the practice of the City of London and the Court of Chancery

THE PROJECTED FEDERATION OF LEEDS BUILDING TRADES.—The Leeds master builders held a meeting on the 23rd ult. in the committee-room of the Royal Exchange, the President in the chair. The federation of the building and allied trades was approved, and representatives of the Master Builders' Association were elected. The demand of the masons was discussed, and there was a disposition to meet the men, conditionally on the rules being modified. The small amount of work done by some of the men and the unwritten rules were referred to as hindering the adoption of a generous policy.

THE PROPOSED DEMOLITION OF A HISTORIC ABERDEEN CHURCH. — The Marquis of Huntly, Lord Rector of Aberdeen University, has received from Mr. A. Marshall Mackenzie, A.R.S.A., architect, a statement to the effect that the question of the retention or not of Greyfriars' Church as part of the University buildings at Marischal College is a subject to which he had given much consideration ever since the first proposals for extensions towards Broad-street were made, and had frequently advised that the old Gothic building should be retained and restored. He held this opinion from artistic reasons, quite independently of the strong antiquarian and historical ones that existed. The quadrangle would lose in effectiveness if thrown entirely open by the removal of the church. In any restoration of the Greyfriars' building the mean-looking modern parts, such as the wing towards the quadrangle and the gable next the entrance-gate, would be demolished, the church lengthened by a bay, and the beautiful series of seven windows facing Broad-street filled with tracery. The restored building would therefore have quite a different appearance from that presented to the eye at present. Its dark freestone colour would form a refreshing contrast to the light grey granite of Marischal College, and the long horizontal lines of the church would, in the same way, enhance by contrast the vertical lines in which Marischal College was designed. The slight departure from the symmetrical position of the south tower, which the retention of the church would involve, was a distinct gain to the general artistic effect of the buildings, and would prevent a feeling of over-rigid symmetry. He feels quite certain that the effect of the whole will be much more delightful and beautiful if the building is retained, to contrast and group with the new, than if it were demolished, and the quadrangle entirely exposed.

ARCHITECT AND CLIENT AT BIDEFORD.—Mr. Robert T. Hookway, architect, at Bideford County Court on the 23rd ult., sued Mr. E. W. Sealy-Vidal, of Abbotsham, for 10*l.* 10s. Mr. A. F. Seldon, for plaintiff, stated that on May 19 defendant instructed Mr. Hookway to prepare plans for a villa at Abbotsham. Two days later defendant asked for plans for

a small bungalow. Plans for the villa were partially completed, and the second set were prepared. On May 22 defendant said he would decide which plans he would have. A few days later, however, he said he had changed his mind, and wanted plans for a smaller villa than the first. A third set of plans were prepared, and defendant caused them to be altered. Specifications were then directed to be drawn, and advertisements for tenders inserted. At Michaelmas the account was sent in. Mr. Hookway, jun., afterwards met defendant, who complained that the fee for the plans was too much. Mr. Hookway, jun., offered to accept 8*l.* 8s. Defendant agreed to pay that amount, but subsequently offered 5*l.* 5s., and said if that was not accepted they could do without it. Mr. Goaman said he was instructed that the "plans" were merely preliminary sketches. Defendant directed plaintiff not to exceed 350*l.*, yet plans were prepared for a villa to cost 850*l.* As to the other plans, there was no instruction, but here the question of reasonable remuneration came in. Judge Beresford came to the conclusion that Mr. Hookway had not exceeded his instructions, and allowed the claim, with costs.

BUXTON AND THE ELECTRIC LIGHT.—At a recent meeting of the Buxton District Council Professor Kennedy's report was submitted as to the electric light. It stated that the estimated cost of works for Buxton would be 18,000*l.* He recommended land belonging to the Council in connexion with the gas works, also the property of the town, for erecting the generating station. It was decided to call a meeting of the Council to discuss details.

THE BISHOP HOOPER MEMORIAL AT GLOUCESTER.—Mr. W. Waller, architect, who was requested to examine the Bishop Hooper monument, which stands on the spot where the martyr was burned at Gloucester, reports that the structure is in a very bad condition, if not actually dangerous. The stone work is very much perished, and at the base of the spire there are serious indications of crushing and settlement.

THE OLD GATEWAY, ST. BARTHOLOMEW THE GREAT.—The plans that have been recently made public for widening Jewin-street, in consequence of the recent great fire, and for connecting it with West Smithfield by means of a road through the centre of the parish of St. Bartholomew the Great, will have, as a consequence, if carried out, the demolition, it is stated, of the Early English gateway which leads from the old priory into Smithfield.

ARTISANS, LABOURERS, AND GENERAL DWELLINGS COMPANY.—The thirty-first annual report of this company shows a continued prosperity. Between the first five years (1867-1871) and the last five (1892-1896) the capital of the company has increased 18,580*l.*, to nearly two and a half millions, the increase of the last term of five years over the preceding one being rather over half a million. On the most recently developed estate—Leigham Court, Streatham—202 houses and 252 "maisonnettes" are let and occupied, and sixty-one houses and eighty-two maisonnettes will be ready for occupation during the year. The rental of this estate for the year was 11,500*l.* 15s. 10d., being an increase of 4,778*l.* 14s. 1d. on the previous year. The Rev. W. H. Booth, vicar designate of St. Margaret's, Leigham Court, has completed the purchase from the company of the site for the permanent church, mission-house and parsonage, which will be proceeded with as soon as possible.

METROPOLITAN ASYLUMS BOARD.—An ordinary meeting of the managers of the Metropolitan Asylum District was held at the County Hall, Spring-gardens, on the 26th ult., Sir Edwin Galsworthy, the Chairman of the Board, presiding. The Finance Committee presented statements showing the net expenditure at the several asylums and hospitals of the managers during the half-year ended at Michaelmas last. They recommended that the estimates of expenditure now submitted be approved and adopted, and that contribution orders be assessed upon the several parishes and unions in the district. Mr. A. C. Scovell, Chairman of the Committee, in moving the adoption of the recommendations, said the total expenditure of the managers for the year ended Michaelmas, 1897, amounted to 665,393*l.*—an increase of 40,270*l.* upon that for the year ended Michaelmas, 1896. This increase was mainly accounted for by the opening of the Brook Hospital involving an additional expenditure of 33,000*l.* The item for maintenance of buildings, including wages and works of a special character, and also furniture, made a total of 69,000*l.* The recommendations of the Committee were adopted. Upon the presentation of the report of the Special Committee in the matter of the Brook Hospital expenditure, Mr. J. Brown said that his name had that day been mixed up by certain London newspapers with what was said to be a gross scandal in connexion with the erection of the Brook Hospital. He had been accused of supplying the bricks which were used in the construction of that hospital. Mr. Brown went on to explain that he was the maker of a special sort of ornamental brick which was used by builders all over the country, and that a comparatively small quantity of the bricks, which had been supplied by him to merchants in London, had been used in the ornamentation of the Brook Hospital. It was, he said, done without his knowledge and it was a matter over which he had no control. He thought the way in which the matter had been brought up was a gross injustice.—Mr. E. White moved the adoption of the Committee's report. In this it was stated that the original estimate for the erection of the Brook Hospital was 194,810*l.*, and the amount of the tenders ultimately accepted 218,171*l.* 16s. 2d., whilst the amount which the managers were asked to pay in settlement of the contractors' final claims was 268,507*l.* 11s. 2d. The difference between the total amount of the accepted tenders, 210,018*l.* 0s. 4d., for which the architect was responsible, and the total amount for which he was prepared to certify in settlement thereof was 49,383*l.* 14s. 8d., of which 10,723*l.* appeared to have been sanctioned by or reported to the Board, leaving the balance to represent the value of work ordered on the architect's individual responsibility over and above the value of the works for which tenders were accepted by the Board. Mr. Aldwinckle, the architect, was blamed by the Committee for having underestimated the amount of work necessary in many cases, and for making no provision in his original estimate for many incidental matters. While he estimated that the cost of extra foundations was about 5,000*l.*, the actual value of the measured and certified work amounted to nearly four times that amount. It was admitted that in the Brook Hospital the managers possessed an admirably arranged and well-built establishment.—Mr. J. H. Brass moved, as an amendment to the Committee's recommendation, that the contractors' claims as finally adjusted be approved, "That the report be referred back to the Committee for them to report as to the cause of extra expenditure, as to the several contractors not executing the work in accordance with their sealed contracts, as to the power of the architect to order additional work without the authority of the Board, and as to whether the certificates of the architect for such work were not *ultra vires*." Mr. Monson seconded the amendment. After some discussion the debate was adjourned.

ELECTRIC LIGHTING, METROPOLITAN FIRE BRIGADE.—The headquarters of the Metropolitan Fire Brigade, Southwark, is to have a complete electric lighting installation. The contract has been let by the London County Council to the National Electric Free Wiring Company. The work comprises steam dynamos, storage batteries, incandescent and arc lighting complete. The "National" patent system of house-wiring is to be used throughout.

VULCAN BOILER AND GENERAL INSURANCE COMPANY, LIMITED.—At the annual meeting of this company the directors presented their report for 1897, which shows that the gross revenue for 1897 was 128,419*l.* 18s. 11d. as compared with 109,826*l.* 16s. 10d. for the year 1896, being an increase of over 18,500*l.* The company has taken over the business of the late "Boiler Insurance and Steam Power Company, Limited," in its entirety.

INDICATOR LATCH FOR LAVATORIES.—Mr. J. N. Maskelyne has patented a new indicator latch for the closets in lavatories, to meet the objection to those now in use, that the word "engaged" does not always fully show (through the bolt being only half shot). In Maskelyne's new indicator this is overcome by an arrangement by which the door cannot be properly fastened until the whole word shows in the opening. The latch is also arranged to be opened from outside by the attendant's key, in cases of emergency, and the indicator can be set to "engaged" by the attendant, should the visitor neglect it.

UNPROTECTED BUILDINGS. — A builder named William Sanderson was summoned at the Second Court of the Sheffield City Police recently for having failed to erect proper hoardings and fencings before the site of two houses he intended to build in Rustling's-road, to separate them from the street. On February 15, a police-constable found the footpath in front of the houses which were in course of erection, for a space of 40 yards, covered with various building materials. There were no hoardings or fences put up to protect the buildings. Defendant, who had previously been cautioned, said other builders did not provide fences, and he thought he could do the same. He was fined 10s., including costs.

DOUGLAS MASTER BUILDERS' ASSOCIATION.—The Douglas master builders inaugurated their Association with a dinner at the Victoria Palace Hotel on the 24th ult. The chair was occupied by Mr. Mark Carine (President of the Association), and the vice-chairs by Mr. W. J. Fargher and Mr. A. E. Loved (Secretary to the Association). In proposing the health of the master builders and success to the Association, Mr. J. J. Taggart said that his knowledge of the history of Douglas taught him that the builders were one of the foremost and most enterprising branches in our industrial life. He congratulated the Association on their good sense in banding themselves together, for this, he said, was bound to benefit them individually and collectively, and promote the prosperity of the building trade of Douglas. The President, in responding, remarked that their Association was formed for the purposes of defence, not defiance. He enumerated the specific objects of such associations, and pointed out the advantages in other places, and how their Association had recently strengthened their own hands in dealing with complications in the trade.—Mr. D. Clarke proposed the health of the architects, and said he was glad to see such a number of them present. The services of an architect were an advantage to the public, as his efforts insured more beautiful and often more comfortable buildings than what the builder would provide if left to his own resources. He would ask Mr. D. Arkell, of Birmingham, who was carrying out the contemplated alterations to that historic old pile, Castle Mona, and Messrs. Rigby, Forrest, and Heslop to respond.—Mr. Arkell congratulated the masters upon their course of action, and gave some practical examples of his own experience in England to show the advantages of such institutions. Speaking of the engagement which brought him to the island, he might say that he had heard many expressions of fear that they were going to ruin the architectural beauties of that interesting old building, and while he did not think there was much real danger on that score, he must remind them that as an architect he was the servant of his clients, and could not have quite all his own way in a matter of this kind: and then his clients were unfortunately compelled to take into consideration the pounds, shillings, and pence of the matter. They were, however, as anxious as any one to retain as much of the historic and interesting associations of the building as was compatible with the considerations he had named.—Mr. Rigby, in the course of his reply, dwelt at some length on the relations between client and architect, and architect, builder, and client, which he pictured as often very critical, requiring considerable forbearance and a good deal of give and take on both sides. Messrs. Heslop and Forrest also replied to the toast. Mr. R. W. Creer proposed the "Town and Trade of Douglas." He coupled the toast with the names of Mr. Hannay and Mr. Broadbent, who responded.

ARCHITECTS' BENEVOLENT SOCIETY.—The annual general meeting of this Society will be held in the rooms of the Royal Institute of British Architects on the 9th inst., to receive the report, balance-sheet, &c. The President, Professor Aitchison, R.A., will take the chair at five o'clock.

THE PEABODY FUND.—The thirty-third annual report of this fund for the year 1897 states the net gain of the year, from rents and interest, at 32,320*l.* 0s. 3d. The capital expenditure on land and buildings during the year was 1,250,390*l.* 10s. 8d. At the end of the year the trustees had provided for the artisan and labouring poor of London 11,367 rooms, besides bath-rooms, laundries, and lavatories. These rooms comprised 5,121 separate dwellings, viz.:—Eighty-six of four rooms, 1,781 of three rooms, 2,426 of two rooms, and 828 of one room. The average rent of each dwelling was 4s. 9¾d. a week, and of each room 2s. 2d. The rent in all cases includes the free use of water, laundries, sculleries, and bath-rooms.

CAPITAL AND LABOUR.

WAGES IN THE PAVING DEPARTMENT, MANCHESTER.—According to the *Manchester Courier*, an advance of 1s. per week has been made in the wages of paviors, beaters, paviors' labourers, flag dressers, flag layers, and flaggers' labourers in the service of the Paving Committee of the Manchester Corporation. After adding the increase just given the Manchester rates will be as follows:—Paviors (number employed 50), 34s. per week; beaters (number employed 83), 25s. per week; paviors' labourers (number employed 95), 23s. per week; flag dressers (number employed 37), 33s. per week; flag layers (number employed 14), 35s. per week; flag layers' labourers (number employed 46), 23s. per week. Fifty-three hours constitute the week.

CARPENTERS' AND JOINERS' SOCIETY.—The thirty-sixth annual report of the Associated Carpenters' and Joiners' Society for the year ended October 31, 1897, has just been printed. The income for the year amounted to 14,182*l.* 3s. 8d., an increase of 1,177*l.* 16s. 5d. over the previous year. The gross expenditure totalled up to 10,870*l.* 15s. 5½d. This sum included 3,729*l.* 18s. 1d. for sick ailment, 1,153*l.* 9s. 1d. for superannuation, 742*l.* for funeral allowance, 809*l.* 17s. 1d. for tools compensation, 289*l.* 16s. 3½d. for strike allowance, 680*l.* 5s. 1d. for unemployed benefit, 121*l.* 17s. in grant from benevolent and contingent fund, and three bonuses of 50*l.* each to disabled members. A gain of 3,311*l.* 8s. 2½d. was left. The number of branches affiliated was 156, with a total membership of 8,786, an increase of nine branches and 786 members.—*Newcastle Leader.*

HOUSE DECORATORS AND PAINTERS, PLYMOUTH.—The journeymen painters and house decorators of Plymouth, having made demands for an increase of wages and shortening of working hours, a conference has taken place between the employers and a deputation from the Amalgamated Society of House Decorators and Painters. The result is that, in future, the men will be paid 7d. an hour, and work will cease at 12 o'clock on Saturdays and at 5.30 on other days, on and after March 5.

COVENTRY MASTER BUILDERS AND PLUMBERS.—The dispute between the Coventry master builders and the plumbers and painters has been settled. A joint meeting of delegates from masters and men was held, at which a compromise was offered by the employers. The masters agreed to concede the men's demand for ½d. per hour increase of wages, provided that they in turn agreed to abide by the old code of working rules, which had been in force for some years, and forego the alterations they

demanded. The plumbers' and painters' representatives were unable to give a decisive answer at once, and the meeting concluded on the understanding that a meeting of the men was to be held and the result of their vote communicated to the master builders. The men subsequently intimated that they were prepared to agree to the masters' terms.

SCARBOROUGH STONEMASONS' WAGES. — The stonemasons of Scarborough gave notice to the Masters' Association six months ago that they wished for an alteration in their rules, and an increase of wages from 8d. to 9d. per hour. The masters and men met the other evening at the Albemarle Hotel, and discussed the questions at issue, and an offer of 8½d. per hour was favourably received by the men, the masters expressing themselves as favourable to the proposed alterations in the rules. Another meeting is to be held.

LEGAL.

AN URBAN DISTRICT COUNCIL AND BUILDING PLANS.

Mr. LAWSON WALTON, Q.C., on the 1st inst., moved in a Divisional Court of Queen's Bench, consisting of Mr. Justice Wright and Mr. Justice Darling, for a rule calling upon the Aston Manor Urban District Council to show cause why a writ of mandamus should not issue commanding them to pass certain plans which had been submitted for their approval in connexion with a building estate in their district. The applicant was the owner of a building estate in the neighbourhood of Birmingham, and within the district of the Sanitary Authority against which the rule was moved.

Counsel said the estate in question was in the course of development, and it was now proposed to build a number of houses, the plans of which had been submitted on an approved plan. It was stated on affidavit that they were in accordance with the regulations, but the Council had refused to pass them on the ground that they did not comply with a notice issued by them, and which it was now submitted was *ultra vires*.

Their Lordships granted a rule.

MEETINGS.

FRIDAY, MARCH 4.

Royal Institution.—Professor T. E. Thorpe on "Recent Results of Physico-Chemical Inquiry." 9 p.m.

SATURDAY, MARCH 5.

Sanitary Inspectors' Association (Carpenters' Hall, London Wall).—Mr. J. F. Skinner on "The Sanitation of Dairy Farms." 6 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Sewage Works, Kingston-on-Thames. 3 p.m.

British Institute of Certified Carpenters (Carpenters' Hall).—Mr. C. T. Aston on "Shoring." 6 p.m.

Perth Architectural Association.—Visit to the Free Library. 2.30 p.m.

MONDAY, MARCH 7.

Royal Institute of British Architects.—(1) Special General Meeting to elect the Royal Gold Medallist for the current year—the Chairman to move that the medal be presented to Professor Aitchison, R.A., President; (2) General Meeting (business) for the election of candidates for membership. 8 p.m.

Surveyors' Institution.—Mr. W. Irvine on "Land Survey and Valuation in Northern India." 8 p.m.

Carpenters' Hall, London-wall (Free Lectures on Matters connected with Building).—Mr. Lewis F. Day on "Wood Carving—its Design and Practice," with lantern illustrations. 8 p.m.

Society of Arts (Cantor Lectures).—Mr. Hugh Stannus on "The Principles of Design in Form." IV. 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Professor A. Bostock Hill on "Trade Nuisances." 8 p.m.

Victoria Institute.—Dr. Gerard Smith on "The Design of the Human Foot." 4.30 p.m.

Society of Engineers.—Mr. W. Fox on "Reservoir Embankments, with suggestions for avoiding and remedying failures." 7.30 p.m.

Liverpool Architectural Society.—Mr. Francis W. Bedford on "Sienna and Baldassare Peruzzi." 6 p.m.

Leeds and Yorkshire Architectural Society.—Nomination of Officers. Exhibition of Institute Prize Drawings.

TUESDAY, MARCH 8.

Society of Arts (Applied Art Section).—Mr. Lewis F Day on "The Making of a Stained Glass Window." 8 p.m.

Sheffie'd Society of Architects and Surveyors.—Mr. C. Castle on "English and Foreign Timber for Building and Decoration."

Institution of Civil Engineers.—Papers to be further discussed: (1) "The Theory, Design, and Practical Working of Alternate-Current Motors," by Mr. Llewelyn B. Atkinson; (2) "Dublin Electric Tramway," by Mr. H. F. Parshall; (time permitting), Mr. Henry Fowler on "Calcium Carbide and Acetylene." 8 p.m.

WEDNESDAY, MARCH 9.

Architectural Association: Discussion Section.—Joint meeting with the Institution of Junior Engineers, at No. 9, Conduit-street, W., Papers on "The Desirability of a Closer Relationship between the Architect and the Engineer" will be read by Mr. Sydney B. Beale, A.R.I.B.A, and Mr. Percy J. Waldram, P.A.S.I. 7.30 p.m.

Architects' Benevolent Society.—Annual General Meeting of subscribers and donors. 5 p.m.

Sanitary Institute.—Dr. Christopher Childs, M.A., will open a discussion on "Water-borne Typhoid." 8 p.m.

Edinburgh Architectural Association.—Mr. J. Campbell Irons on "The Architectural Antiquities of Leith." 8 p.m.

Society of Arts.—Professor J. Ewing on "Linde's Method of Producing Extreme Cold and Liquefying Air." 8 p.m.

St. Paul's Ecclesiological Society (Chapter House, St. Paul's).—Rev. E. S. Dewick, F.S.A., on "The Coronation Services of the English and French Kings." 7.30 p.m.

THURSDAY, MARCH 10.

Society of Antiquaries.—8.30 p.m.

Royal Institution.—Professor J. A. Fleming on "Recent Researches in Magnetism and Dia-magnetism." II. 3 p.m.

Society for the Encouragement of the Fine Arts.—The first Conversazione, at the Galleries of the Royal Institute of Painters in Water Colours, Piccadilly. 8.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. J. F. J. Sykes on "Objects and Methods of Inspection, Nuisances, &c." 8 p.m.

Institution of Electrical Engineers.—Continuation of discussion on Mr. G. Bingswanger-Byng's paper on "The Manufacture of Lamps and other Apparatus for 200-volt Circuits." 8 p.m.

FRIDAY, MARCH 11.

Architectural Association.—Mr. Hippolyte J. Blanc on "Scottish Ecclesiastical Architecture in the Fourteenth and Fifteenth Centuries." Illustrated by lantern views. 7.30 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. H. C. Adams on "The Drainage of Cottage Property." 8 p.m.

SATURDAY, MARCH 12.

Institution of Junior Engineers.—Conversazione, at Westminster Palace Hotel.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Friern Barnet Sewage Works. 3 p.m.

Edinburgh Architectural Association.—Visit (1) to the Leith Academy, Leith Links; (2) Old Leith.

Perth Architectural Association.—Visit to the New Post-office. 2.30 p.m.

RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until April 9.

[1897.]—2,586.—COMBINED STOP AND REGULATING VALVE AND PIPE UNION: *W. Tennent.*—For facilitating repair and non-interference with any other tap, the water union has flat faces and semi-circular ports, the female face has a recess to receive a male face fitted with washer and ports, and held in position by a flange; when the male face is turned half round the ports are reversed, thus forming a stop valve.

2,733.—FLUSHING WATER-CLOSETS, URINALS, AND FOR OTHER PURPOSES: *W. H. Witham.*—For a limited discharge the tank has a stationary syphon, from whose outlet the down pipe has a deep seal, a relief valve for escape of air, operated by hand, and an air pipe connected with the syphon top.

3,087.—SASH-PULLEY CASES OR BODIES: *J. Mills.*—The sash-pulley consists of a case or body, made in two pieces, of sheet-metal, and pulley with spindle; the pulley is secured with a rivet, and the front and back of the case are folded and lapped together.

5,749.—DUPLICATION OF WRITINGS, DRAWINGS, &C. *H. Jofeh.*—A stencil frame detachably mounted in or on a pivoted frame is so arranged that it can be normally held in an inclined raised position above the platen by a weight or spring, whereby the printing paper may be readily laid on and removed from the platen, and the stencil paper to or from the stencil frame.

6,325.—MAP CASE OR HOLDER: *P. Wallis.*—This has a stiff metallic or other frame in two parts, hinged together, each part carrying a roller capable of rotating with the ends of the map affixed thereto, a flexible back, and a transparent front capable of expanding to permit of the whole map being wound upon one roller.

7,141.—HEATING AND DISTRIBUTING AIR IN STOVES AND FIRE-PLACES: *H. M. Ryder.*—The combination with the receptacle of a fire-place or grate of a casing placed therein and provided with a supply pipe opening outside the room; the casing has a distributing pipe or pipes connected with an air register in the room.

7,656.—COATING AND ORNAMENTING METALLIC SURFACES: *J. Harrington.*—A coating of size or varnish is applied to the surface; when this is partially set it is dusted over with an absorbent fibrous material rolled or pressed thereon; the surface is then stoved, and after the operation has been repeated as often as is necessary, it is either French polished, or dressed with harness paste to give it the appearance of leather.

8,626.—STAINING OR COLOURING METALS AND OTHER MATERIALS: *Moss & Davis.*—The stain is prepared by adding half the quantity of perchloride of iron to equal quantities, say one pint, of hydrochloric acid and nitric acid, with about 1 oz. of powdered cupric sulphate; to these are added about 3 oz. of steel or iron, and 2½ pints of water; the material is dipped into the solution, placed in a dry heat chamber at about 100° F. for say thirty minutes, then exposed to steam, then again dried, placed in boiling water, and finally immersed in cold water. The stains are fixed by the alternate exposure to dry and damp heat.

9,406.—WALL COVERINGS WITH DESIGNS IN RELIEF: *A. G. Haehre.*—"Endless" pieces can be made by starting from the crude wood pulp, or an unworked paper pulp, ground with water, passing upon sieve cylinders, thence upon felt, to the pressing rollers; the upper roller carries the design, the lower roller, made of rigid material, is pressed against the upper roller, and so causes the design to be pressed in, thus flattening of the ornaments is prevented; the wall-paper can be backed, it is claimed to be air-tight and adapted to keep off moisture.

25,649.—FLOOR AND LINING CRAMP: *Reece & Davies.*—This consists of a metal shoe provided with means for gripping the joist or stud, and having a sliding toothed plunger operated by a lever pivoted to the shoe; it has also a toothed boss, which engages the teeth of the plunger; the plunger can be retained in position to enable the hold on the lever to be released whilst the flooring or lining is nailed.

29,026.—BRUSHES: *W. Williams.*—In order that the bristles may be folded down when the brush is not in use (so as to occupy less space and to protect the bristles) the inventor employs movable bristle carriers operated by a plate or sliding piece which engages with projections upon the bristle carriers; the ends of the projections are shaped so that when opposite the recesses in the movable plate and turned for engagement with the pivots in the sides of the casing, they will be secured.

29,158.—FIRE-EXTINGUISHING TANKS: *P. Casey, junior.*—This comprises a cylindrical tank having an outlet in its bottom and in its top a lid-covered opening; also a series of parallel grates within; water passing through the tank dissolves a certain quantity of rock salt arranged therein.

29,910.—SCREENING AND ELEVATING CRUSHED STONE, ORE, AND THE LIKE: *W. H. Baxter.*—The screen has, say, its receiving end made at any inclination over two in twelve, and the angle iron or flange usually employed at the inlet is dispensed with. In place of the customary slight inclination at the screen's outlet end, the inventor makes that end above the elevator's belt level, and provides, on the inner periphery of the elevator pulley, direction plates set angle-wise with the screen's axis; to prevent the material when lifted from working through the joints of the elevator plates and so damaging the belt, he arranges the plates to overlap one another, and in some cases dispenses with the main backing of the belt hitherto used.

30,591.—WHEELBARROWS AND THE LIKE: *R. A. Kneeland.*—To relieve the workman from heavy loads upon his arms, the barrow is provided with automatically supported handles and a rear wheel; the workman grasps the handles and straightens up with them to the point corresponding to his height, ratchet teeth on the side pieces of a frame between the handles (and carrying the axle of the auxiliary wheel) engage, at that height, with loop guides on the handles, and so relieve his arms, the auxiliary wheel thereby drops down; it is claimed that all he needs do is to prevent the barrow from tipping over and push it along; in passing an obstruction he bears heavily upon the handles so as to lighten the load on the front wheel.

NEW APPLICATIONS.

For week ending February 19.

3,600, E. Taylor, Polishing Wheels. 3,602, W. E. Mason, Safety Joint. 3,617, J. Woodhouse, 3,899, F. Jones, and 4,092, P. Fraser, Sash Fastener. 3,622, J. Shanks, Taps and Fittings for Baths, Lavatories, &c. 3,634, Coales & Kitchin, a Door Latch. 3,635, E. J. Cavanagh, Screws for Metal and Wood Work. 3,641, F. A. Small, Water-closet Cisterns. 3,645, J. F. Wallmann & Co., Single Wire Telegraphy. 3,648, C. F. Martin, Rulers. 3,657, Cantley & Springbom, Composition for Making Moulded Articles. 3,658, H. F. Passavant, 3,705, M. J. Adams, and 3,987, P. Stern, Water-closets. 3,661, Walker & Clement, and 3,799, J. F. Jürgen, Automatic Gas Regulators. 3,668, H. W. Stillwell, Soldering Aluminium Joints. 3,677, H. L. Kent, Pulverising and Granulating Mills. 3,690, H. McPhail, Drying Wood, &c. 3,695, E. Wilson, Magnetic Circuits. 3,702, J. P. Guy, Pressing Bricks and other Solid Earthenware Articles. 3,708, G. Marshall, Water Channel or Conductor. 3,721, J. Dangerfield, Furnace Fire Grates. 3,723, Hodgkinsons, Roof and Similar Glazing. 3,751, Witters, Automatic Fire-Extinguishing Sprinklers. 3,760, Barford & Smith, Cistern Ball Valves. 3,762, A. Roberts, Blind Roller Brackets. 3,773, E. Breslauer, Clutches, Coupling Devices, &c. 3,792, Russell & Favor, Door Checks and Closers. 3,793, W. S. Wilkinson, Refining of Asphalt. 3,798, Merryweather & Jakeman, Pipe Couplings. 3,802, H. Edmunds, Electrical Conductors. 3,803, T. A. Ready, and 3,935, Perkins & Newton, Extinction of Fire. 3,804, J. Van Landuyt, Veneer Cutting Machines. 3,805, T. H. Minshall, and 3,960, Williams & Walters, Electrical Switches. 3,806, H. O. Swoboda, Electric Circuits. 3,838, A. Webb, Electric Accumulators. 3,843, Perle & Others, Lathes. 3,846, Bennett & Others, Oil Stoves. 3,859, J. B. Pearson, Fastening Corrugated Sheets for Roofing, &c. 3,864, J. Bousfield, Sliding Door Detachable Rollers. 3,866, J. Shanks, Syphon Flushing Apparatus for Water-closets. 3,876, Katharine W. Smith, Hammers and other Tools. 3,880, Uehling & Scott, Metal Casting. 3,886, E. Le R. Antony, Combined Wrench and Screw-driver. 3,887, A. F. Hardy, Oil Cans, &c. 3,894, R. Kaudelka, Brick Presses, and Moulding Plastic Materials. 3,900, F. Grumbacher, Preserving, Colouring, and Hardening Wood. 3,916, J. B. Furneaux, Windlasses. 3,925, Gover & Moffat, Electric Safety Fuses and Lamp Connexions. 3,943, A. W. Borlase, Automatic Window Fastener. 3,949, W. Morrison, Cooking Ranges, Stoves, and Fire Grates. 3,974, J. E. Robinson, Saw Benches. 3,977, E. B. Kubasch, Automatic Window Closer. 3,990, F. Müller, Optical Projection Apparatus. 4,000, J. B. Lee, for Surveying with the Aid of Photography. 4,009, T. Young, Embossing of Metals, &c. 4,026, G. Bauer, Safety Suspending Lift Apparatus. 4,039, J. Broomhall, Draught-excluder for Doors. 4,066, J. W. Brown, Pipe Joints. 4,073, F. H. Brooke, Glazed Bricks, &c. 4,079, A. G. für Cartonnagen-Industrie, Decorative Surfaces. 4,080, P. G. Wayne, Ratchet Spanner. 4,082, S. S. Hazeland, Chimney Pots. 4,097, Hoffmann Manufacturing Company & E. G. Hoffmann, Circular Cutters for Lathes, &c. 4,115, Sugg & Lofts, Ventilating Cowls. 4,116, T. J. Vail, Lift or Elevator Safety Brakes. 4,119, J. Walker, Drain Gullies or Gully Traps. 4,133, Usill & Browne, "Trigonometry Grapho-mechanically Demonstrated." 4,146, A. Hopkins, a Wrench. 4,147, J. J. Inglis, Water Trapped Closet Basin. 4,160, A. Reid, Portable Gas Stoves. 4,168, R. J. Lee, Open Grates and Fire-places. 4,179, R. Mackay, Ventilators. 4,183, A. Cashin, Locks and Latches. 4,190, H. T. Bush, Drain Traps. 4,191, E. Harder, Safety Platform for Ladders. 4,214, J. Riley, Venetian Blinds. 4,217, H. M. Whitehead, Composition for Making Tiles, Slabs, Panels, Pipes, &c., for Building Purposes. 4,219, J. Fletcher, Refuse Destructors. 4,220, J. J. Kayll, System of Wall Decoration.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

February 15.—By G. J. ROBINSON (at Thirsk).

Carlton Husthwaite, Yorks.—"Back Lane Farm," 71 a. 2 r. 0 p., f. and c.	£3,500

February 16.—By J. H. HIBBARD.

Chelsea.—Upper Cheyne-row, a sculptor's premises, u.t. 40 yrs., g.r. nil	410
Britten-st., i.g.r., 80*l.*, u.t. 7 yrs., g.r. 30*l.*	260
Milner-st., "Stanley House," u.t. 45 yrs., g.r. 1*l.* 5s., r. 135*l.*, with reversion to other property	1,700
Milner-st., l.g.r. 21*l.*, u.t. 33 yrs.	375
Rawlings-st., l.g.r. 6*l.*, u.t. 44 yrs.	110
22 to 31, Orford-st., and l.g.r. 6*l.*, u.t. 3 yrs., g.r. 20*l.*, r. 264*l.*	375
Ovington-st., l.g.r. 35*l.*, u.t. 44½ yrs.	690
Ovington-st., l.g.r. 7*l.*, u.t. 33 yrs.	110

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
*Additions to Workhouse	Whitechapel Union	B. J. Capell, 70, Whitechapel-road E.	Mar. 7
*Roadmaking and Paving Works	Lewisham B. of W.	Surveyor, Town Hall, Catford	Mar. 8
Additions to Railway Station, Redruth	G.W. Rly. Co.	G. K Mills, Sec. Paddington Station, W.	do.
Two Cottages, Avonmouth, nr. Bristol	do.	do.	do.
Alterations, &c. at Workhouse, Portrack-lane	Stockton-on-Tees Union	J. Rodham, 16. Finkle-st. Stockton-on-Tees	do.
Granite and Slag	Bourne (Lincs) R.D.C.	C.W. Bell, Council's Offices	do.
Store Premises, Dudley, near Newcastle-on-Tyne	Cramlington Co.-op. Soc.	J. G. Crone, Archt. 50, Grainger-st. Newcastle	do.
Three Cottages, Bankfield, Linthwaite, Yorks	G. Haigh	J. Berry, Archt. 9, Queen-street, Huddersfield	do.
Thirty-one Cottages, Penmaenmawr, N. Wales	Brundrit & Co.	R. Davies, Archt. Bangor	do.
Stables, &c. Albany-road, Chorlton-cum-Hardy	Wellington (Lancs) U.D.C.	A. H Mountain, C.E. Town Hall, Withington	do.
Additions to Hospital, South Worplesway, Mortlake	Barnes U.D.C.	G. B. Tomes, C.E. High-street, Mortlake	do.
Road Materials	Rowley Regis (Staffs) U.D.C.	D Wright, Council's Offices, Old Hill, Staffs	Mar.
Laundry, House, &c. Milton-street	Eccles (Lancs) Corp.	H. Lord, Archt. 42, John Dalton-st. Manchester	do
Alterations, &c. Boyle Hall, Leeds	.....	Nelson & Savage, Archts. 15, Park-row, Leeds	do.
Paving, Sewering, &c. Bannister-street, &c.	Stretford D.C.	Mr. Royle, Surv. Council's Offices, Old Trafford, Manchester	do.
House, North Foreshore-road	Scarborough T.C.	H. W. Smith, Boro. Engr. Castle-road	do.
Road Works, Agnes-road-west, &c.	Barnsley T.C.	J. H Taylor, C E. St. Mary's-place, Barnsley	do.
Hotel, Trelewis, nr. Treharris, Mon	Messrs. Lewis	T. Roderick, Archt. Clifton-street, Aberdare	Mar. 10
Greenhouses, Sheds, &c. at Cemetery, Mitcham-road	Croydon Corp.	E. Mawdesley, Town Hall, Croydon	do.
Additions to Workhouse	Dudley Union	E G. Coslett, Archt. 21, Wolverhampton-st. Dudley	do.
School Chapel, Heniage-st. Grimsby	.....	G. H. Eves, 154, Freeman-street, Grimsby	do.
Painting, &c. Wesleyan Church, Mumbles	.....	Rev. G. S. Phillips, 3, Langland-rd. Mumbles	do.
Chimney, &c. Electricity Works, Prince Rock	Plymouth Corp.	J. Paton, Engr. Municipal Offices	do.
Wesleyan Chapel, Elmswell, Ipswich	.....	Eade & Johns, Archts. Cornhill-chmbrs. Ipswich	Mar. 11
Residence, Hipperholme, Yorks	.....	R. Berry, Archt. Commercial-st Halifax	Mar. 12
Two Villas, Seaton, Workington	J. F. Donald	J. Donald, Archt. John-st. Workington	do.
Additions to Schools, Dorstone, Herefordshire	.....	Nicholson & Hartree, Archt. Hereford	do.
*Stoneware Pipe Sewers, Manholes, &c. Pumping Machinery, &c.	Broadstairs and St. Peter's U.D.C.	H Law & Son, 17, Victoria-street, S.W.	do.
Additions, South Parade	Deal Corp.	T. C. Golder, Boro. Surv. 23, Queen-street, Deal	Mar. 14
School, Langworthy-road, Seedley	Salford Sch. Bd.	Potts, Son, & Pickup, Archts. Salford	do.
Additions to Hospital, White Hoe, Braddan, Isle of Man	.....	T. G. Taylor, C E Municipal Offices, Douglas	do.
Schools, Whitehall, West Bromwich road	Walsall Sch. Bd.	Bailey & McConnah, Archts. Bridge-street, Walsall	do.
*Articles, Works, &c.	Rotherhithe Vestry	J. J. Stokes, Vestry Hall, Lower-road, S.E.	do.
*Erection of Superstructure of Asylum with Offices, &c.	County Boro West Ham	L. Angell, Town Hall, Stratford, E.	do.
Store Buildings and House, Hirst, Ashington	Ashington Equitable Store	J. English, The Store, Ashington, Durham	Mar. 15
Three Stone Bridges, Crook-Burnfoot ford, &c. Bewcastle	Longtown R.D.C.	J. Murray, Surv. Alstonby, Carlisle	do.
Warehouse, North Docks Goods Yard, Liverpool	Lancs & Yorks Rly. Co.	H. Sheimerdine, Archt. Hunts. Bank, Manchester	do.
Making-Up Leonard-road, &c. Mitcham	Croydon R.D.C.	Surv. Council's Offices, Fell-road, Croydon	Mar. 16
*Boundry Walls and Gates	Hackney Union	T. R. Coles, Union Offices, Homerton, N.E.	do.
*Workshops	do.	do.	do.
*Works and Materials	St. Giles B. of W.	G. Wallis, 197, High-Holborn, W.C.	do.
*Making-up and Paving Road	Fulham Vestry	C. Botterill, Town Hall, Walham Green, S.W.	do.
Police Station, King's Norton	Worcestershire C.C.	H Rowe, County Surv. Worcester	Mar. 18
School, Spring-hill, Accrington	.....	H. Ross, Archt. Cannon-street, Accrington	Mar. 19
Three Shops and Houses, Wharf-street, Sowerby Bridge, Yorks	.....	C. F. L. Horsfall & Son, Archts. Lord-street-chambers, Halifax	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered
Road, Talgarth	Brecon and Radnor Joint Asylum	Gough & Trollope, Archts. 23, Craven-street, S.W.	Mar. 19
House, Londonderry	B. Smith	W. E. Pinkerton, Archt. 8, Diamond, Londonderry	Mar. 21
*Cast Iron Water Pipes, &c.	Leigh-on-Sea U.D.C.	J. Mansergh, 5, Victoria-street, S.W.	do.
*Painting, &c. at Kennington Park and Bostall Woods	London County Council	Archt.'s Dept. Spring-gardens, S.W.	do.
*Cast Iron Water Mains and Accessories	Langport R.D.C.	Clerk's Office, Langport, Som.	do.
*Block of Buildings	Brighton Guardians	H. S. Reed, Archt. Prince's-street, Brighton	Mar. 22
Street Works, Heysham-road, &c.	Southampton Corp.	W. B. G. Bennett, Boro. Engr. Municipal Offices	do.
*Drainage of Workhouse Premises	Malling Union	J. Ladds, 7, Doughty-st. Mecklenburgh-sq. W.C.	Mar. 23
Culvert, Brampton Bryan, Salop	Wigmore R.D.C.	H.W. Bowen, Surv. Wigmore	Mar. 25
Church, Aghadowey, co. Derry, Ireland	Rev. B. Mulholland	J. J. O'Shea, Archt 124, Donegall-street, Belfast	do.
*Cottage Homes	Gloucester Union	W. B Wood, 12, Queen-street, Gloucester	Mar. 28
*New Infirmary Buildings	Windsor Union	Edgington & Summerbell, Archt. Windsor	April 2
Two Villas, Dalston-road, Carlisle	W. M Johnstone	Johnstone Bros. Archt. 39, Lowther-street, Carlisle	No date
*Two Ward Blocks at Workhouse	St. Marylebone Gdns.	A. Saxon Snell, 22, Southampton-bldgs. W.C.	do.
Shop, &c. 45, Lowther-street, Carlisle	C. Walker	T. T. Scott, Archt. Carlisle	do.
Boundary Wall, Avenue, &c. Ballyhest	Carrick-on-Suir Union	J. Mullins, Union Offices, Carrick-on-Suir	do.
Restoration, St. James's Church, Colchester	.....	C. E. Butcher, Archt. 3, Queen-street, Colchester	do.
Eight Houses, Unity-grove, Harrogate	Harrogate Co-op. Soc.	S. Coates, Offices, Albert-street, Harrogate	do.
Six Houses, Ryecroft, Yorks	.....	A. E. Davies, Oldham-rd. Ashton	do
Assembly Hall, &c.	Basingstoke Co-op. Soc Ltd.	R.S. Wallis, Archt. Potter's-lane, Basingstoke	do.
Houses, Meadow Hall-lane, Kimberworth, Yorks.	J. B. Jenkinson	H. L. Tacon, Archt. 11, Westgate, Rotherham	do.
Villa, Southey-street, Nottingham	.....	H. J. Price, Archt. 24, Low Pavement, Nottingham	do.
Chapel, Oswestry	Primitive Methodist Committee	J. D. Mould, Archt. King-street, Manchester	do.
House, at Steam Laundry, Park-road, Peterborough	Park Sanitary Steam Laundry Co.	J. G. Stallebrass, Archt. North-st. Peterborough	do.
*Construction of Roads	Church Stretton Land Co. Ltd.	S. H. Horton, Effingham House, Arundel-st. W.C.	do.
Restoration of Church, Whitgift, near Goole	.....	Smith, Brodrick, & Lowther, Archt. 77, Lowgate, Hull	do.
Seven Cottages, &c. Brickyard-road, Selby	.....	W. Green, Ousegate, Selby	do.
Villa, Bangor, co. Down	S. Keighley	T. Pentland, Archt. 35, High-street. Belfast	do.
Bridge, Kettleby Beck, Lindsey	.....	J. Thropp, County Surv. 29, Broadgate, Lincoln	do.
Business Premises, Queen-street, &c. Ramsgate	Gwyn & Co.	W. J. Jennings, Archt. 4, St. Margaret's-street, Canterbury	do.
Warehouse and Factory Extensions, Park-place, Leeds	W. Albrecht & Co.	Ambler & Bowman, Archt. 9, Park-place, Leeds	do.
Extensions at Asylum, Exminster	Devon County Asylum Visitors	E. H. Harbottle, Archt. County-chambers, Exeter	do.
New Roads and Streets, Hasland	.....	W. C. Jackson, Archt. 29, Knifesmith-gate, Chesterfield	do.
Offices, Downhills	Tottenham Sch. Bd.	Campbell & Son, Surv. 4, Finsbury-circus, E.C.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in.
*Clerk of Works	Wimbledon U.D.C.	.....	Mar. 14
*Surveyor	Monmouthshire C.C.	140*l.* rising to 160*l.* per an.	Mar. 16
*Clerk of Works	Carlisle Corp.	.....	No date

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p.* — *Contracts, pp.* iv. vi. viii. *&* ix. *Public Appointments, pp.* xix. *&* xxi.

22, Whitehead's-grove and 10a, College-st., r. 105*l.*, and l.g.r. 10*l.*, u.t. 10 yrs., g.r. 24*l.* £530
Camberwell.—Hardess-st., f.g.r. 9*l.*, reversion in 69 yrs. 255
Wimbledon.—Tabor-grove, f.g.r. 21*l.*, reversion in 69 yrs. 615
Plaistow.—Plaistow-rd., f.g.r. 27*l.*, reversion in 71 yrs. 710
Surbiton.—2, 3 and 4, The Pavement, u.t. 80 yrs., g.r. 30*l.*, r. 210*l.* 2,440

By DEBENHAM, TEWSON, & CO.

Wimbledon.—Haydon's-rd., &c., a plot of building land, f. 140
6, 8, 10, 12, 16, 22, 24, 26 and 30 to 74 (even), Cromwell-rd., u.t. 91 yrs., g.r. 201*l.* 10s., r. 951*l.* 8,070
76, 88 to 120 (even), Cromwell-rd., f., r. 540*l.* 8,060
63 to 101 (odd), Cromwell-rd., f., r. 605*l.* 9,160
3 to 61 (odd), Cromwell-rd., u.t. 91 yrs., g.r. 195*l.*, r. 910*l.* 8,120
276 to 288 (even), Haydon's-rd., u.t. 91 yrs., g.r. 70*l.*, e.r. 285*l.* 2,510
290, Haydon's-rd., u.t. 91 yrs., g.r. 15*l.*, r. 55*l.* 530
292 to 308 (even), Haydon's-rd., u.t. 91 yrs., g.r. 90*l.*, e.r. 440*l.* 4,980
Haydon Pk.-rd., a plot of land, 32 p., f. 270
10 to 36 (even), Haydon Pk.-rd., u.t. 91 yrs., g.r. 90*l.*, e.r. 408*l.* 3,020
42 to 74 (even), Haydon Pk.-rd., u.t. 91 yrs., g.r. 119*l.*, r. 515*l.* 3,700
3 to 11 (odd), Haydon Pk.-rd., f., r. 150*l.* 2,360
13 to 47 (odd), and 55 and 57, Haydon Pk.-rd., u.t. 91 yrs., g.r. 140*l.*, e.r. 616*l.* 4,750
Haydon's-rd., &c., a corner plot of land, 33 p., f. 520
3 to 36, Gap-rd., u.t. 91 yrs., g.r. 238*l.*, e.r. 1,020*l.* 7,200
Avondale-rd., &c., enclosure of building land, 7 a. 3 r. 12 p., f. 5,500

By N. EASTON & SON (at Hull).

Mapleton, &c., Yorks.—"The Mapleton Estate," 694 a. 3 r. 36 p., f., with the Manor of Mapleton 14,000

February 17.—By FULLER, MOON & FULLER (at Croydon).

Croydon.—9, 11, and 13, Cromwell-rd., and 16 to 26 (even), Devonshire-rd., f., r. 169*l.* £1,400
42 to 52 (even), Lower Addiscombe-rd., f., r. 201*l.* 10s. 2,800
Mitcham.—Upper Green, two freehold shops and cottage, with yard, stabling, &c., r. 60*l.* 2s. 550

By CHESTERTON & SONS.

Cheapside.—Queen-st., "The Golden Fleece" p.-h., f.g.r. 110*l.*, reversion in 59½ yrs. 4,900
Kennington.—61, Kennington Pk.-rd., with timber and dairyman's yards in rear, u.t. 12 yrs., g.r. 32*l.* 10s., r. 113*l.* 10s. 570
50, 52, and 54, Albert-st., u.t. 53 yrs., g.r. 15*l.*, r. 84*l.* 805
Albert-st., l.g.r. 24*l.*, u.t. 53 yrs. 480
Albert-st., i.g.r. 10*l.*, u.t. 46 yrs., g.r. nil 225

By H. J. BLISS & SONS.

Hackney.—8, Pembroke-ter., u.t. 74 yrs., g.r. 6*l.* 6s. 290
Kingsland.—31 and 32, Dunston-rd., f. 475
New Southgate.—1 and 2, Acacia-villas, f. 325
St. George's East.—66 and 68, Red Lion-st., f. 485

By HUNTER & HUNTER.

Horselydown.—30 to 42 (even), Lafone-st., u.t. 12½ yrs., g.r. 35*l.*, r. 187*l.* 525
Fulham.—12 and 14, Archel-rd., u.t. 79 yrs., g.r. 8*l.* 620
Kilburn.—3, 5, 11, and 13, Princess-rd., u.t. 60 and 64 yrs., g.r. 24*l.*, r. 134*l.* 1,300
Camden Town.—Great College-st., l.g.r. 12*l.* 12s., u.t. 41 yrs. 210
Kensington.—Warwick-rd., i.g.r. 21*l.*, u.t. 40½ yrs., g.r. nil 370
Shaftesbury-rd., &c., i.g.r. 27*l.*, u.t. 40½ yrs., g.r. nil 490

By MATTHEW MILES.

Battersea.—51 and 53, St. John's-rd., and the "Buck's Head" b.-h., f., r. 37*l.* 3,260

By J. H. HIBBARD.

Chelsea.—Hasker-st., l.g.r. 139*l.*, u.t. 30 to 46 yrs. 31 and 41, Hasker-st., r. 66*l.*, also l.g.r. 20*l.*, u.t. 46 yrs., g.r. 47*l.*, with reversion to other property £800
Old Ford.—Roman-rd., f.g.r. 23*l.*, reversion in 48 yrs. 800
Parnell-rd., f.g.r. 9*l.*, reversion in 57 yrs. 285
Hammersmith.—Blythe-rd., f.g.r. 56*l.*, reversion in 61 yrs. 1,675
Blythe-rd., &c., "Old Parr's Head" p.-h., f.g.r. 7*l.*, reversion in 61 yrs. 790
Masborough-rd., f.g.r. 45*l.*, reversion in 59 yrs. 1,260
Springvale-ter., f.g.r. 8*l.*, reversion in 64 yrs. 210

By CHARLES ATKINS.

Bromley, Kent.—Addison-rd., f.g.r. 12*l.*, reversion in 86 yrs. 335
Lewisham.—10, 12, and 14, Court-hill-rd., f., r. 69*l.* 1,110
20, 52, 54, and 56, Court Hill-rd., u.t. 69 yrs., g.r. 40*l.* 10s. 760
17, Hither Green-lane, f., e.r. 45*l.* 740
Hither Green-lane, a freehold block of buildings and land, r. 70*l.* 6s. 745
Forest Hill.—105, Stanstead-rd, f., r. 26*l.* 375

February 18.—By ROBERT REID.

Chiswick.—54, Woodstock-rd., u.t. 78 yrs., g.r. 14*l.*, r. 80*l.* 650

By E. & S. SMITH.

Gray's Inn-rd.—50 and 52, Britannia-st., f., r. 104*l.* 810
Caledonian-rd.—91, 93, and 95, Southampton-st., u.t. 28 yrs., g.r. 17*l.* r. 114*l.* 675

February 19.—By J. THORNBOROUGH (at Butter Knowle).

Butter Knowle, Durham.—"Foster House Farm," 8 a. 2 r. 16 p., c. 490
An enclosure of land, 5 a., c. 160

February 21.—By PERCIVAL HODSON.

Crouch Hill.—18 and 20, Blythwood-rd., f., e. r. 101*l.* 1,500

By JONES, SON, & DAY.

Mile End.—25, 26, and 27, Maidman-st., u.t. 45 yrs., g.r. 12*l.* 420
3, Ewing-st., u.t. 77 yrs., g.r. 5*l.* 5s. 260

By NIGHTINGALE, PHILLIPS & Page.
Kingston Hill, Surrey.—Brunswick-rd., "Brunswick House," f., r. 80*l.* £1,520
By ALFRED RICHARDS.
Wood Green.—1 and 2, Rutland Villas, f., r. 44*l.*.. 725
Hornsey.—24 and 26, Ravenstone-rd., u.t. 79 yrs., g.r. 13*l.*, r. 62*l.* 570
Victoria Park.—10, Rutland-rd, u.t. 55 yrs., g.r. 4*l.*, r. 28*l.* 300
By ALFRED THOMAS, PEVER, & MILES.
Tipton, Stafford.—"The Old Lion Brewery," with 23 public and beer-houses attached, f..... 27,500
By WOOTTON & GREEN.
Ashstead, Surrey.—Skinner's lane, "The Nest," f., r. 55*l.* 850
Skinner's-lane, a freehold cottage, r. 25*l.*..... 510
February 22.—By HERRING, SON, & DAW.
Streatham.—217, High-rd., u.t. 68 yrs., g.r. 18*l.*, r. 100*l.* 1,350
By SEGRAVE, BROWETT, & TAYLOR.
Camden Town.—Wellington-st., &c., i.g.r. 120*l.* 10s., u.t. 13¾ yrs., g.r. 3*l.* 950
Kennington.—Wynyard-st., i.g.r. 48*l.* 18s., u.t. 6½ yrs., g.r. 18*l.* 18s..... 115
Regent's Park.—Glentworth-st., i.g.r. 27*l.* 6s., u.t. 3 yrs., g.r. nil., with reversion for 1¾ yrs. 175
Long Acre.—21, Betterton-st., f., r. 55*l.*..... 1,015
By WESTON & SONS.
Brixton.—8, Chantry-rd., u.t. 73 yrs., g.r. 6*l.* 10s., e.r. 38*l.* 380
Lee.—2 and 4, Summerfield-st., u.t. 62 yrs., g.r. 6*l.* 6s..... 175
Wimbledon.—12, Queen's-rd., u.t. 79 yrs., g.r. 12*l.* 10s., e.r. 65*l.* 780
Wandsworth.—53, Vardens-rd., u.t. 71½ yrs., g.r. 8*l.*, r. 45*l.* 370
By W. W. READ & Co.
City of London.—Lombard-st., f.g.r. 200*l.*, reversion in 36 yrs. 12,200
Marylebone.—83, Upper Gloucester-pl., u.t. 23 yrs., g.r. 16*l.* 16s., e.r. 75*l.* 420
Stratford.—158 to 170 (even), Maryland-rd.; 91, 93, and 95, Leyton-rd., and "The Telegraph" b.-h.; 2 to 8 (even), Beddingfield-st.; 51 to 67 (odd), Major-rd., f., r. 569*l.* 7,000
9, 11, 13, and 15, Major-rd., and 2, 4, and 6, Waddington-st., u.t. 49 and 57 yrs., g.r. 24*l.* 9s., r. 106*l.* 12s. 650
Forest Gate.—103, Sebert-rd., f., r. 28*l.* 505
By HUMBERT & FLINT (at Watford).
Watford, Herts.—2, 4, and 6, Francis-rd., f., r. 79*l.* 6s. 1,005
121 to 131 (odd) Pinner-rd., f., r. 97*l.* 10s. 980
By W. R. MOUNSEY (at Penrith).
Morland, Westmoreland.—"The Towcett Estate," 234 a. 3 r. 22 p., f. 6,500
Various enclosures of land, 15 a. 3 r. 18 p., f. ... 475
February 23.—By HOBSON, RICHARDS, & Co.
Hoxton.—113 to 122, Shaftesbury-st., u.t. 33 yrs., g.r. 192*l.*, r. 340*l.* 785
By PROTHEROE & MORRIS.
Buckhurst Hill.—George-villas, f.g.r. 4*l.* 4s., reversion in 67 yrs. 120
By DOUGLAS, YOUNG, & Co.
Balham.—9, 11, and 13, Temperley-rd., f., r. 90*l.*.. 435
Beckenham.—3, Hartington-villas, f., e.r. 45*l.* 600
By HARMAN BROS.
Stoke Newington.—39 and 41, Bethune-rd., u.t. 77 yrs., g.r. 16*l.*, r. 90*l.*..... 980
Clapton.—21, Beechholme-rd., u.t. 71½ yrs., g.r. 8*l.* 8s., r. 36*l.* 330
By R. TIDEY & SON.
Islington.—31, Dean-st., u.t. 29 yrs., g.r. 5*l.*, r. 34*l.* 260
Barnsbury.—98, Richmond-rd., u.t. 8 yrs., g.r. 6*l.* 4s. 8d. 190

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G. ton	8/0/0	0/0/0
Teak, E.I....load	10/0/0	15/:/0
Sequoia, U.S.ft.cu.	1/8	1/10
Ash, Canada, load	3/c/0	4/5/0
Birch, do.....	2/15/0	4/7/6
Elm, do.....	3/15/0	4/15/0
Fir, Dantsic, &c..	1/9/2	3/9/0
Oak, do.....	2/10/0	3/1c/0
Canada	3/15/0	5/0/0
Pine, Canada red	0/0/0	0/0/0
Do. yellow	2/2/6	4/2/6
Lath. Dantsic, fath	4/1c/0	5/1c/.
St. Petersburg..	5/0/0	6/10/0
Wainscot, Riga, &c., log.....	3/5/0	5/0/0
Odessa, crown.....	3/5/0	5/0/0
Deals, Finland 2nd & 1st std 100	7/10/0	8/c/0
Do. 4th & 3rd ..	7/10/0	8/:/0
Do. Riga	6/0/0	7/0/0
St. Petersburg, 1st yellow	9/10/0	12/0/0
Do. 2nd yellow.	8/1:/0	10/0/0
Do. white.....	8/0/0	1:/0/0
Swedish	8/10/0	15/0/0
White Sea	9/0/0	15/10/0
Canada, Pine 1st	19/5/0	25/5/0
Do. do. 2nd	13/15/0	16/5/0
Do. do. 3rd, &c.	6/5/0	9/15/0
Do. Spruce, 1st	9/15/0	11/5/0
Do. do. 3rd and 2nd	7/5/0	8/5/0
New Brunswick Battens all kinds	6/15/0	7/5/0
boards, sq., 1 in. prep. 1st.....	5/0/0	28/0/0
Do. 2nd	0/0/0	0/16/6
Other qualities...	0/9/6	0/13/0
Cedar, Cuba, ft.	c/6/0	0/7/0
Honduras, &c.	/4	/4½
Mahogany, Cuba	/3½	/4½
St. Domingo, cargo av.	/5	/6½
Mexican, do. do.	/4½	0/5/3
Tobasco, do. do.	/3½	/4
Honduras, do.	/4	/6½
Box, Turkey, ton	/4½	/6
Rose, Rio	4/0/0	15/0/0
Bahia	7/0/0	14/0/0
Satin, St. Doming.	6/0 0	12/0/0
	0/0/5	0/1/0

TIMBER *(continued)*.		
Satin, Porto Rico	0/0/6	c/1/6
Walnut, Italian ..	0/-/3	c/0/7
METALS.		
Iron—Pig, in Scotland .....ton	2/6/1	2/6/3½
Bar, Welsh, in London	5/15/0	5/17/6
Do. do. at works in Wales	5/10/0	5/12/6
Do. Staffordshire, in London.....	6/5/0	7/10/0
COPPER—British cake and ingot	53/5/0	53/15/0
Best selected ..	54/5/0	54/15/0
Sheets, strong..	59/1c/0	60/0/0
Chili bars	50/6/3	0/0/0
YELLOW MTL. lb.		5d.
LEAD—Pig Spanish ....ton	22/10/0	0/0/0
English com. bands	22/15/0	0/0/0
Sheet, English 6 lbs. per sq. ft. and upwards ..	23/15/0	c/0/0
Pipe.....	24/5/0	0/0/0
ZINC—English sheet.....ton	20/5/0	0/c/0
Vieille Montagne	21/10/0	0/0/0
Spelter	18/1/3	18/2/6
TIN—Straits	65/1/3	0/0/0
Australian.....	65/10/0	66/0/0
English Ingots..	67/10/0	68/10/0
Banca	61/0/0	0/0/0
Billiton	59/15/0	60/0/0
OILS.		
Linseed .....ton	16/7/6	0/0/0
Cocoanut, Cochin	27/15/0	c/0/0
Do. Ceylon.....	22/0/0	c/0/0
Palm, Lagos	21/15/0	0/0/0
Rapeseed, English pale	27/10/0	0/0/0
Do. Brown	26/0/0	c/0/0
Cottonseed ref....	14/5/0	15/5/0
Oleine.....	13/10/0	14/10/0
Lubricating U.S.	0/5/3	0/7/6
Do. Black	0/5/0	0/6/6
TAR—Stockholm barrel	1/0/0	0/0/0
Archangel	0/12/6	0/0/0
Turpentine .....24/cc'		0 0/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. N.B.—We cannot publish Tenders unless authenticated by the name and address of the sender; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under £100, unless in some exceptional cases and for special reasons.]

BARKING.—For erecting shops at Barking. Mr. F. S. Hammond, architect:—

Lark & Son	£5,096	Johnson	£4,992
Shurmur	5,015	Gibb	4,400

BUCKFASTLEIGH (Devon).—For the construction of sewage outfall and purification works, for the Urban District Council. Mr. J. Willcocks, Surveyor, Buckfastleigh. Quantities by Surveyor:—

H. E. Wilkins	£2,683 3 7	Dart Pollard	£2,109 12 2
E. Duke	2,600 0 5	T. Lung & Sons ..	2,599 5 7
J. Shuddock	2 344 19 3	G. Arscott, Buckfastleigh*	2,225 6 8
Thomas Webb ...	2,321 3 6	A. Thomas	2,020 14 8½
J. Fisher	2,238 13 9		
W. Gibson	2,228 5 10		

* Accepted.

BURNLEY.—For the construction of sewer, for the Rural District Council. Mr. S. Edmondson, District Surveyor, 18, Nicholas-street, Burnley:—

Smith & Boocock ..	£2,414 11 2	Thos. Horrocks	£1,718 6 8
E. Cheetham	1,957 0 0	Edmund Heap	1,660 15 0
J. & G. Duxbury ..	1,841 13 3	Joseph Wadge.....	1,642 1 9
Emanuel Riley	1,828 3 4	Metcalfe & Dinsdale	1,561 1 5
T. Dent & Sons	1,822 16 9	J. & J. Lee	1,557 9 0
G. Read & Son	1,818 11 4	J. & M. Hawley,	
H. Fotherby & Son	1,804 0 9	Colne*	1,320 4 0
Smith Bros.	1,747 6 3		

* Accepted.

BURTON-ON-TRENT.—Accepted on a schedule of prices for erecting a mineral water factory at Stapenhill, for Mr. Sam Lowe. Mr. Thomas Jenkins, architect, 35, High-street, Burton-on-Trent. Quantities by the architect:—

Chamberlain Bros., Burton-on-Trent.

BURTON-ON-TRENT.—Accepted for erection of two houses, Scalpcliffe-road, for Mr. T. W. Shotton. Mr. Thomas Jenkins, architect, 35, High-street, Burton-on-Trent. Quantities by the architect:—

Bricklaying, &c.—G. Parker, Burton-on-Trent	£297 10
Joinery, &c.—J. Leedham, Burton-on Trent	120 0
Plumbing, Stoves, and Ironwork	135 0
	£552 10

EGHAM.—For erecting new mission hall, Hythe Fields, Egham for Mrs. Nicholson. Mr. J. W. Oades, architect, Egham:—

W. Beauchamp	£377	R. Rontaud (accepted)	£274
W. G. Jackson	285		

EGHAM.—For erecting seven cottages, Crown-street, Egham, for Mrs. Hammond. Mr. James W. Oades, architect, Egham:—

W. Satchwell	£2,047	W. Beauchamp	£1,683
G. Gray	1,930	R. Rontaud	1,475
W. Oades	1,905	C. Buckeridge, Egham*	1,377
W. Searle	1,703		

* Accepted.

EXETER.—Accepted for alterations to the Whipton Sanatorium for the City and County of Exeter:—

General Builders, 15, Southampton-row, Holborn, W.C. £135

GODALMING.—For laying out about three acres of land as new filter beds and construction of new carrier at Unstead Sewage Farm. Mr. J. H. Norris, Borough Surveyor. Quantities by Borough Surveyor:—

G. Horn	£1,378 0 0	Streeter Bros.	£875 19 0
G. A. Franks	989 17 4	Mitchell Bros.	813 0 0

[Borough Surveyor's estimate, £853 7s. 6d.]

HARWICH.—For additions to schools at Congregational Church, for the committee. Mr. J. W. Start, architect, Harwich:—

W. Chambers	£855	Saunders, Harwich*	£719
Dupont	795		

* Accepted.

HORSFORTH (Leeds).—For the erection of a house situate in Low-lane, Horsforth, near Leeds, for Mr. W. S. Rider. Mr. W. Squires, architect, Leeds:—

Bricklaying and Masonry.—J. B. Allwood, Leeds	£215 0
Boundary Walls and Concreting.—J. Ellis, Harrogate.....	75 0
Carpentry and Joinery.—J. Child & Sons, Horsforth	77 15
Plumbing and Glazing.—T. Breascliffe, Horsforth	28 15
Plastering.—A. Marsden, Bramley	35 0
Slating.—W. Shevill, Leeds	29 7
Painting.—S. Clayton, Horsforth	13 10
Fixtures, &c.—Dixon & Sons, Leeds	60 0

IPSWICH.—For erecting a higher grade school, Ipswich. Messrs. J. S. Corder and Walter Brand, architects. Quantities by Mr. S. Parmenter, Ipswich:—

Kenney.....	£15,216	Girling	£13,966
Grimwood	14,825	Bennett	13,500
Parkington	14,262		

KIRKCALDY (N.B.).—For the erection of six shops and fifteen houses, High-street, for the Whitehouse Estates Company. Mr. Robt. Little, architect, 4, St. Brycedale-avenue, Kirkcaldy:—

Masonry.—Geo. Smith & Son.....	£4,150 0 0
Joinery.—Thos. Scott & Co.....	2,576 0 0
Plumbing.—Jas. Johnston	985 12 6
Slating.—Currie & Cant	148 2 0
Plastering.—Wm. Ure	516 18 0
Ironwork.—Barnet & Morton.....	633 6 6
	£9,009 19 0

LEICESTER.—For the erection of four villas, Narboro-road, Leicester, for the West End Builders' Society. Mr. S. R. Bakewell, architect, Park View, Mere-road, Leicester. Quantities by the architect:—

Bradshaw Bros.	£1,818	Gurney	£1,536
Riddett & Son	1,802	Leicester Builders, Ltd...	1,500
Jeffs & Edwards.....	1,683	Tyrrell (accepted)	1,430

LONDON.—For the erection of two warehouses on a site at the corner of Golden-lane and Hatfield-street, E.C., for Mr. W. R. Sutton. Mr. John Groom, architect. Quantities by Mr. Henry Theobald, 48, Finsbury-pavement, E.C.:—

Mowlem & Co.	£17,958	Mattock Bros.	£15,791
Downs	16,273	Killby & Gayford.....	15,736
B. E. Nightingale	16,585	J. Greenwood	15,637
Woodward & Co.....	16,327	Grover & Son	15,468
Lawrence & Son	16,200	H. L. Holloway*.....	15,440
Stimpson & Co	16,149		

* Accepted.

LONDON.—For the erection of new Rectory at Bow. Messrs. W. A. Hills & Son, architects:—

J. Mowlem & Co.	£2,791	W. Downs	£2,588
J. T. Robey	2,700	S. Salt.....	2,577
Woodward & Co.	2,620	W. Shurmur	2,493
Perry & Co.	2,596	Sheffield Bros.....	2,347

LONDON.—For rebuilding Nos. 9 to 27, Fitzroy-place, N.W. Mr. A. E. Hughes, architect:—

Woodward.....	£7,559 2 6	Higgs & Hill	£6,984 3 0
Williams.....	7,425 2 6	Chessum	6,939 2 0
Hall Beddall.....	7,374 1 0	Downs.....	6 683 3 0
Shurmur.....	7,247 2 0	Faulkner	6,527 2 6
Webber	7,080 2 6		

LONDON.—For building a factory, Golden-lane. Mr. J. W. Stevens, architect:—

Reason	£4,827	Stimson & Co.....	£4,373
Shurmur	4,662	White & Co.....	4,335
Leath & Harris	4,553	Castle	4,248
Mattock Bros.....	4,532		

LONDON.—For the erection of the "Cornwall Arms" public-house and two cottages, Bethnal Green. Mr. W. J. Ingram, architect:—

Maxwell Bros.....	£2,556	Whitehead	£2,325
Parsons	2,430	Beer & Gash	2,297
Rowe	2,410	W. Shurmur.....	2,284
F. & F. H. Higgs	2,370	Barker	2,249
Ling	2,338	Courtney & Fairburn	2,117

LONDON.—For alterations and additions to the "Windmill" public-house, Uxbridge-road. Mr. H. J. Wakley, architect:—

Higgs	£8,700	Shurmur.....	£8,194
Scrivener	8,565	Antil.....	£8,100
Patman & Fetheringham	8,395		

LONDON.—For erecting two houses, Fairleigh-road, Stoke Newington. Mr. J. Hamilton, architect:—

Saewin Bros.	£1,939	Beale	£1,798
Shurmur	1,923	Goodall	1,797
Jarvis & Sons.....	1,896		

LONDON.—For rebuilding the "Freemasons' Arms" public-house, Kensington. Messrs. Bird & Walters, architects:—

Joslin & Young	£8,670	Beer & Gash.....	£7,725
Williams & Sons.....	8,150	Tomms	7,719
W. Shurmur.....	7,990	J. E. Todd	7,690
Lowell & Lightfoot	7,943	Ancel	7,660
Lawrence	7,839	Burman	7,598

LONDON.—For rebuilding the "Thomas à Becket" public-house, Old Kent-road. Mr. R. Willcocks, architect:—

Lascelles	£11,678	Antil & Co.....	£11,145
Stimpson	11,560	Killby & Gayford	11,535
Maddison	11,526	Eddie	10,748
Shurmur	11,152	Patman & Fotheringham	10,195

LONDON.—For erecting a factory, St. Paul's Wharf, Shadwell. Mr. G. Drew, architect:—

Clarke & Bracey.....	£4,837	Patman & Fotheringham	£4 596
Yerbury	4,720	Ashby & Horner	4,488
C. Cox.....	4,669	Wood.....	4,487
W. Shurmur	4,634	Higgs & Hill	4,484
Nightingale	4 632	Harris & Wardrop	4,397

LONDON.—For stabling, &c., at Kennington-lane, for the New London Brewery Co. Mr. J. Hamilton, architect:—

B. E. Nightingale	£2,075	W. Shurmur.....	£1,970
Jarvis & Son.....	1,973	W. Smith	1,959

LONDON.—For erecting a factory at Kingsland-road, for Messrs. Ransome. Messrs. J. & A. Bull, architects:—

F. & H. Higgs	£3,993	Patman & Fotheringham	£3 493
Stevens	3,796	W. Shurmur.....	3,443

LONDON.—For the erection of St. John's Park-mansions, Tufnell Park. Mr. S. Perks, architect:—

Lidstone	£7,358	Symes.....	£6,699
W. Shurmur.....	6,984	Johnson	6,494

LONDON.—For foundations of St. John's Park-mansions, Tufnell Park. Mr. S. Perks, architect:—

Lidstone	£1,077	Shurmur	£898
Scott	927	Johnson.....	842

LONDON.—For alterations, &c., to the "Island Queen" public-house, Pentonville. Mr. H. H. Tasker, architect:—

E. Lawrence & Son	£3,488	Edwards & Medway	£3 347
Barrett & Power.....	3,474	Beer & Gash	3,172
W. Shurmur.....	3 452	Hunt & Son.....	2,536
Willmott & Sons.....	3,388		

LONDON.—For the erection of two warehouses on the site of Nos. 40, 42, 44, and 46, Scrutton-street, Shoreditch, E.C., for Mr. W. R. Sutton. Mr. John Groom, architect. Quantities by Mr. Henry Theobald, 48, Finsbury-pavement, E.C.:—

W. Downs	£10,490	H. L. Holloway	£9,473
Scrivener & Co.	10,376	Grover & Son	9,442
B. E. Nightingale.....	9 585	J. Greenwood	9,368
Killby & Gayford.....	9,736	Mattock Bros (accepted)	8,977
Stimpson & Co.	9,600		

LONDON.—For pulling down and rebuilding Nos. 5, 6, and 7, Singer-street, Shoreditch, E.C., for Mr. A. Flint. Mr. John Groom, architect. Quantities by Mr. Henry Theobald, 48, Finsbury-pavement, E.C.:—

Stimpson & Co.....£7,770		Lawrence & Son	£7,362
Killby & Gayford	7,736	J. Greenwood	7,262
H. L. Holloway	7,626	Grover & Son (accepted)	7,246
Mattock Bros.....	7,391		

LONDON.—For rebuilding "The Eagle" public-house, Chobham-road, Stratford, E., for Messrs. Savill Bros., Limited. Mr. Henry Poston, architect, 39, Lombard-street, E.C. Quantities by Messrs. R. L. Curtis & Sons:—

J. & H. Cocks.....	£6,850	Hearle & Farrow	£6,328
Gregar & Son.....	6,750	A. Reed	5,996
W. J. Maddison.....	6 550	G. E. Todd & Co.*	5,933

* Accepted.

LONDON.—For the erection of a warehouse on a site in New-street, at the corner of Hatfield-street and French-alley, Golden-lane, E.C., for Mr. W. R. Sutton. Mr. John Groom, architect. Quantities by Mr. Henry Theobald, 48, Finsbury-pavement, E.C.:—

Downs.....	£8,890	Killby & Gayford	£8,536
Stimpson & Co.	8,760	B. E. Nightingale	8,447
Patman & Fotheringham..	8,621	Grover & Son	8,436
H. L. Holloway	8,600	J. Greenwood*	8,382
Mattock Bros.	8,585		

* Accepted.

LONDON.—Accepted for alterations at 8, Paternoster-row. Mr. Crossby, architect:—

W. Vanstone £584 10

LONDON.—For alterations and additions to the "Bell" public house, Wandsworth-road, S.W., for Messrs. Barclay, Perkins, & Co., Limited. Mr. Geo. Hubbard, architect, 23, Finsbury-circus, E.C.:—

Wall & Co.	£2,100	Turtle & Appleton	£1,920
Balaam Bros.	2,052	W. Nash, Crown Works, New Cross, S.E.*	1,891
Godson & Sons	2,052		
J. C. Richards	2,035		

* Accepted.

LONDON.—Accepted for alterations and improvements to 72, Acton-street, Gray's Inn-road, for the Amalgamated Society of Railway Servants. Messrs. Goodey & Cressall, architects, Colchester:—

General Builders, 15, Southampton-row £1,670

LONDON.—For alterations and repairs at 95, Jermyn-street. Mr. S. Skrimshire, architect:—

Styles	£660	Charles Brown & Son	£617
Warburton & Goldring	637		

MACCLESFIELD.—For the execution of sewerage works, Poynton, for the Rural District Council. Mr. J. Thorpe, surveyor, 19, King Edward-street, Macclesfield. Quantities by surveyor:—

T. & W. Meadows	£5,583	A. Taylor	£4,475
W. Underwood & Bros.	5,113	J. Randall	4,415
A. Kellett	4,782	F. Barke, Stoke-on-Trent	4,076
M. Hall & Sons	4,761		
J. Slinger & Sons	4,599		

* Accepted.

MACROOM (Ireland).—For the erection of drying-chamber at the workhouse, for the Union Guardians. Mr. A. W. Barnard, C.E.:—

W. Coughlan	£140	Perrett & Co., Cork	£120

[Contract adjourned for six months.]

NEATH (Wales).—For the erection of schools, Gnoll Park-road, for the School Board. Mr. J. Cook Rees, architect, St. Thomas'-chambers, Neath. Quantities by architect:—

Howells Bros.	£12,032	Walters & Johns	£11,150
Morgan Cox	11,990	A. George	11,121
Walkin Williams	11,699	Wm. Daniel	11,090
D. E. Davies	11,600	John Rees	10,999
Henry Billings	11,550	D. Jenkins	10,999
Thomas Walkins	11,295	J. Davies	10,673
Edward Groom	11,160	C. & F. Gain, Port Talbot (accepted)	10,530
Bunnett Bros.	11,150		

NORTHAMPTON.—For laying two miles water main, for the Rural District Council. Mr. W. Hull, engineer, 12, St. Giles'-street, Northampton. Quantities by engineer:—

H. Evans	£1,163 18 8	Higgins	£985 0 0
Jenkinson & Son	1,125 0 0	Geo. Fisher	975 0 0
H. Martin	1,085 0 0	Wingrove & Stanley	974 0 0
W. Smart	1,075 0 0	H. A. Lee	968 0 0
R. Cosford	1,049 0 0	B. Clarke, Northampton*	938 0 0
Branson & Son	1,038 0 0		

* Accepted subject to the approval of the Local Government Board.

PLYMOUTH.—For the erection of blocks of dwelling-houses, Howe-street, &c., for the Corporation. Mr. J. Paton, Borough Engineer, Municipal Offices, Plymouth:—

Shellabear & Son	£19,820	A. N. Coles	£17,716
H. E. Skinner	18,819	W. E. Blake	16,737
T. May	18,780	W. Trevena	16,200
Pethick Bros.	18,482	Wakeham Bros.*	16,159
Goad & Co.	18,472		

* Accepted.

[All of Plymouth.]

PONTEFRACT.—For additions to club premises, for the Conservative Club Committee. Messrs. Greaves & Sidebottom, C.E., Ropergate-chambers, Pontefract:—

George Spur	£455	H. Wright, Pontefract*	£345
R. Wray	402		

* Accepted.

PRESTON.—For erecting a new school, and for extensions to present buildings, Royal Cross School. Messrs. Sames & Green, architects, 65, Northgate, Blackburn:—

M. Shorrock	£3,570	J. Christian, Preston*	£3,459

* Accepted.

PRESTON.—For erecting a new sanatorium, Royal Cross school, Preston. Messrs. Sames & Green, architects, 65, Northgate, Blackburn:—

John Christian, Preston* £975

* Accepted out of five tenders.

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RUSHDEN (Northamptonshire).—For erecting seven cottages, Oswald-street, Rushden. Mr. Arthur Garnar, architect, 66, Oakhurst-grove, East Dulwich, London, S.E.:—

C. E. Bayes £1,320 0 0

[No competition.]

ST. ALBANS.—For erecting a villa, Aetna-road, for Mrs. MacLarty. Mr. Percival C. Blow, architect, 7, London-road, St. Albans:—

J. & W. Savage	£500	Bushell*	£454
E. Dunham	468		

* Accepted subject to slight modification.

SOUTH SHIELDS.—For rebuilding the "Britannia" Hotel, Charlotte-terrace, for Messrs. J. Rowell & Son, Ltd. Mr. J. W. Donald, architect, Russell-chambers, South Shields. Quantities by Mr. J. P. Allen, Newcastle:—

J. & W. Lowry	£4,378 0 0	W. B. Ingram	£3,808 5 7
N. W. Maughan	4,285 19 9	W. H. Brown	3,696 14 5
J. C. Hope	3,995 0 0	S. Shariff	3,695 0 0
J. Moore	3,963 0 0	R. Harper	3,645 4 8
W. Christie	3,820 3 0	R. Allison, Whitburn*	3,568 0 0

* Accepted.

WALTHAMSTOW.—For building schools at Brummer-road, Walthamstow. Messrs. J. & K. Cutts, architects:—

Morris	£2,487	Shurmur	£2,132
Porter	2,299	Bentley	2,125
Lawrence	2,215	Scott	1,997
Fuller	2,181		

WEST BRIDGFORD (Notts.).—For the execution of paving works, &c., for the Urban District Council. Mr. W. Pare, C.E., Bridge-grove, West Bridgford. Quantities by the Surveyor:—

J. H. Vickers	£1,315 18 0	Cox & Son	£1,041 19 11
Cope & Raynor	1,234 0 0	Bower Bros., Halifax*	1,040 0 0
J. Barry	1,110 0 0		

* Accepted conditionally.

WIMBLEDON.—For the erection of electric light station at Wimbledon. Mr. A. H. Preece, engineer:—

Yerbury & Co.	£3,984	Lorden & Sons	£3,333
Bulled & Co.	3,720	Thomas & Edge	3,261
Wall & Co.	3,578	Minter & Co.	2,990
Jas. Burges	3,388		

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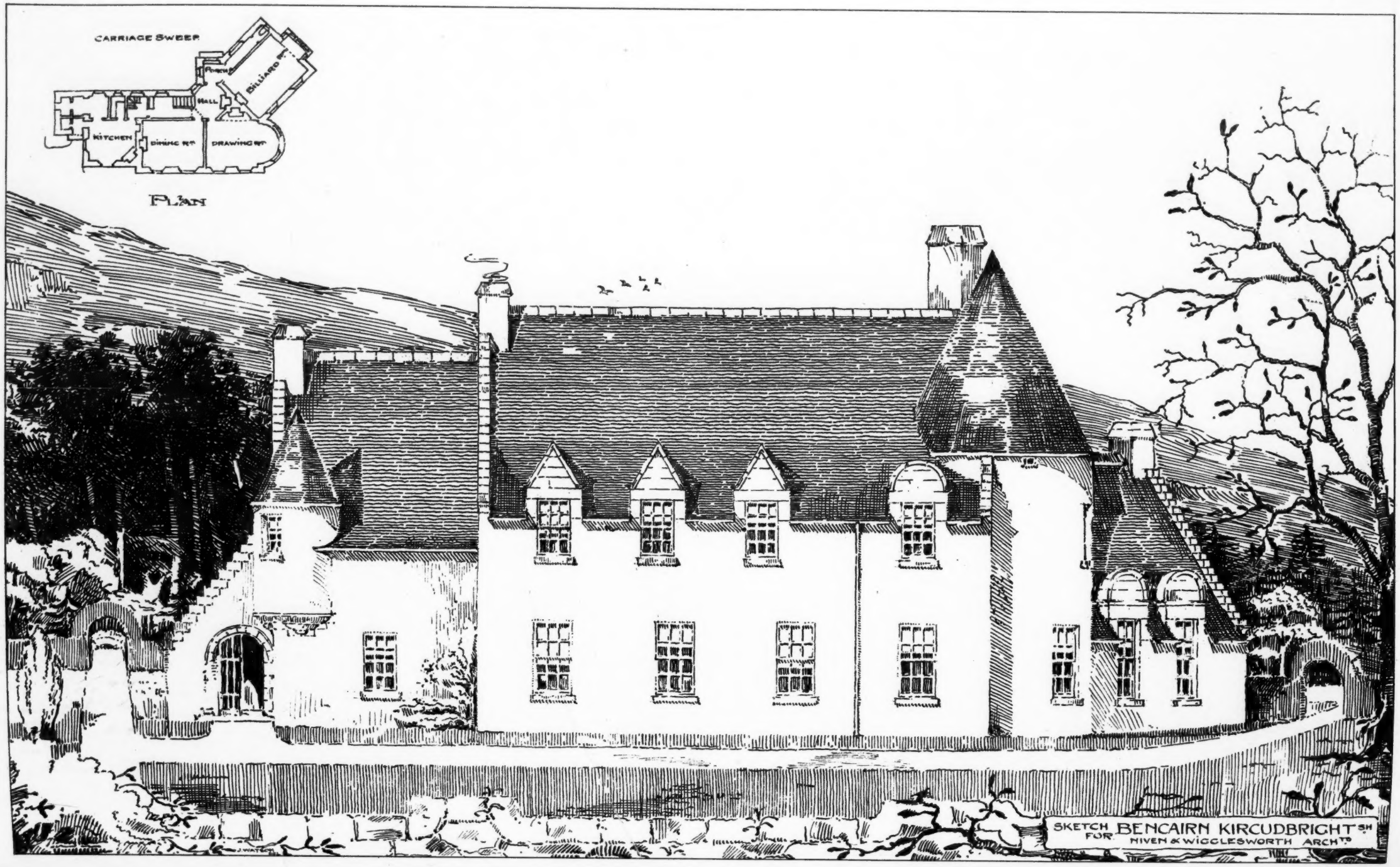
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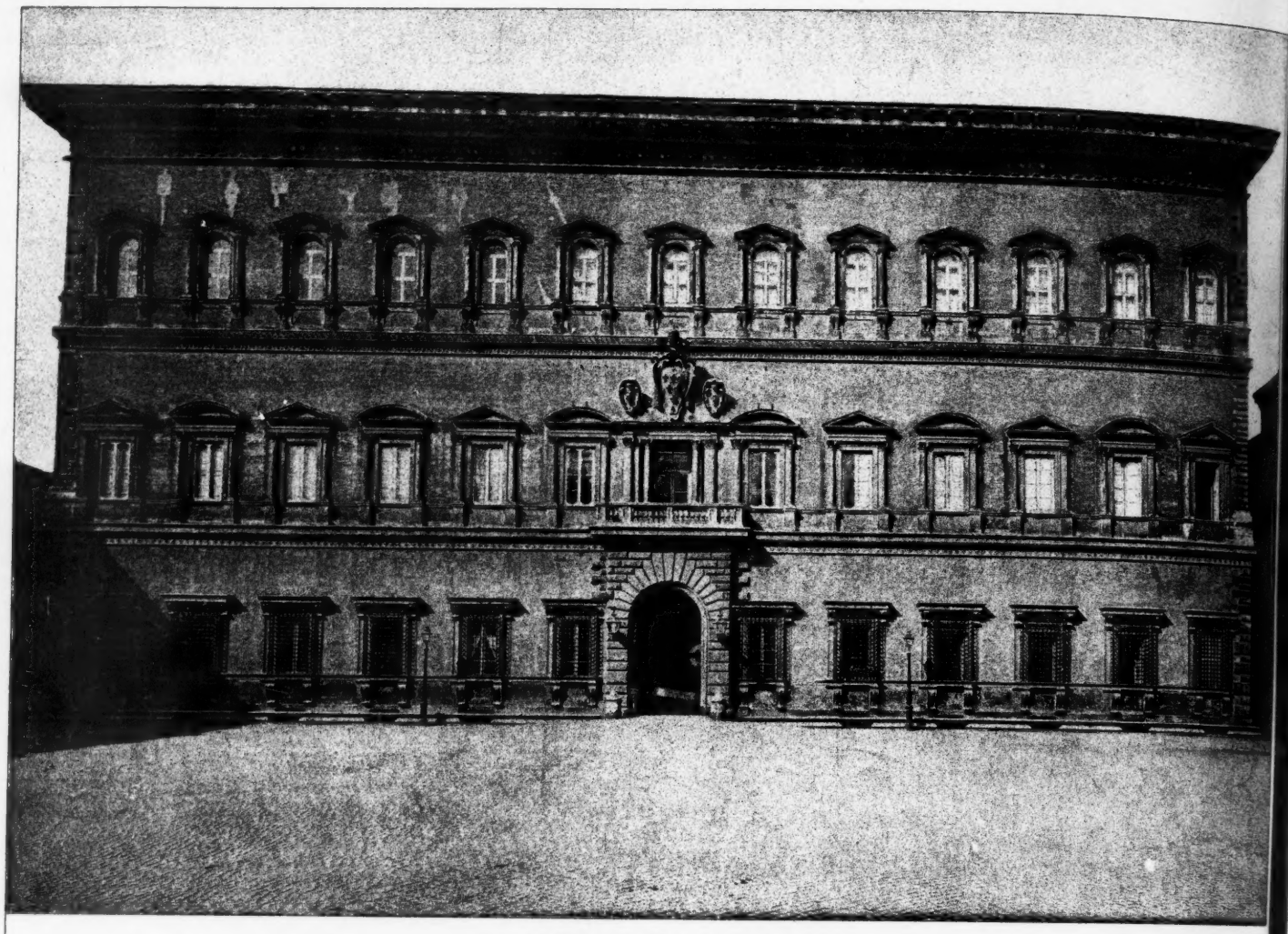

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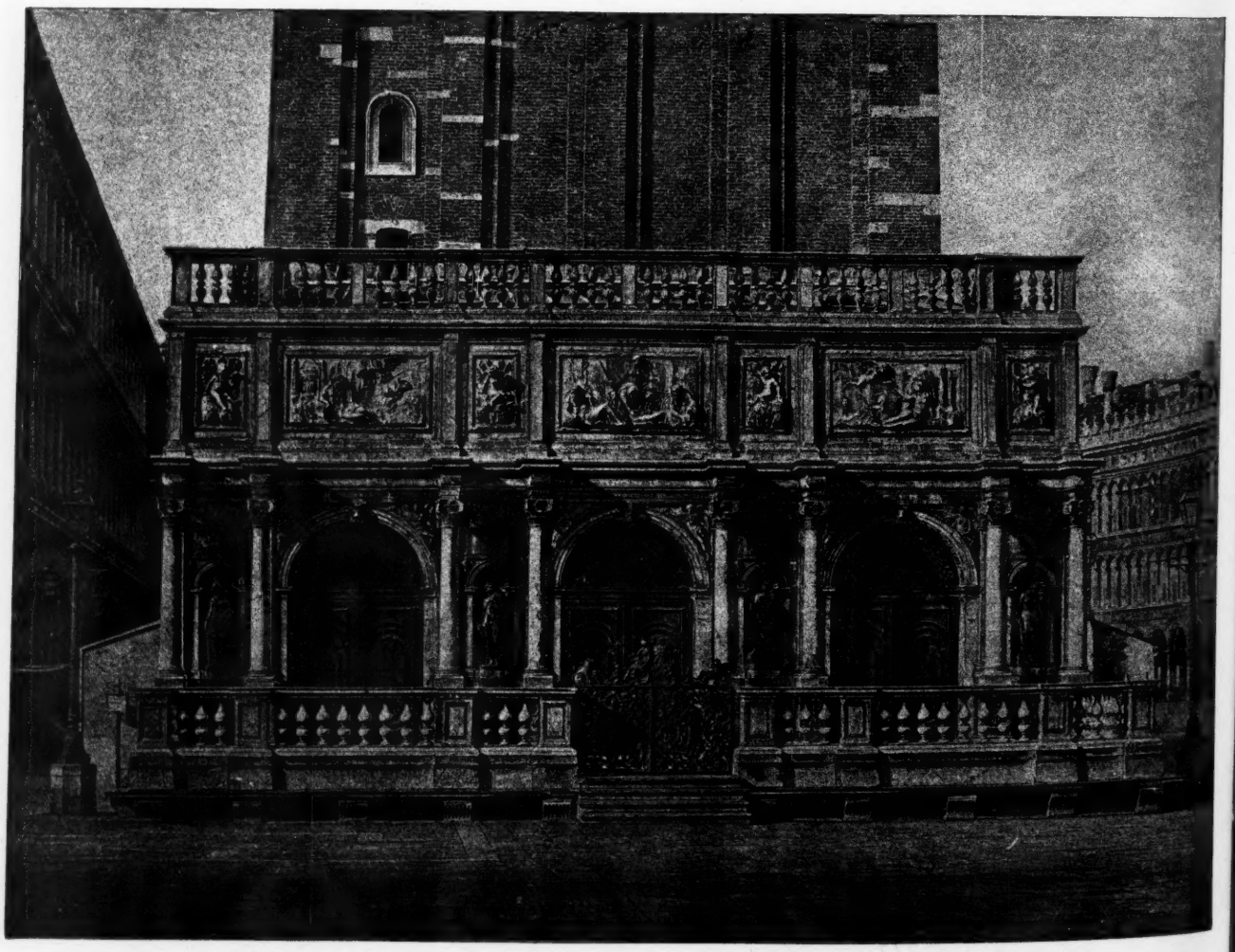

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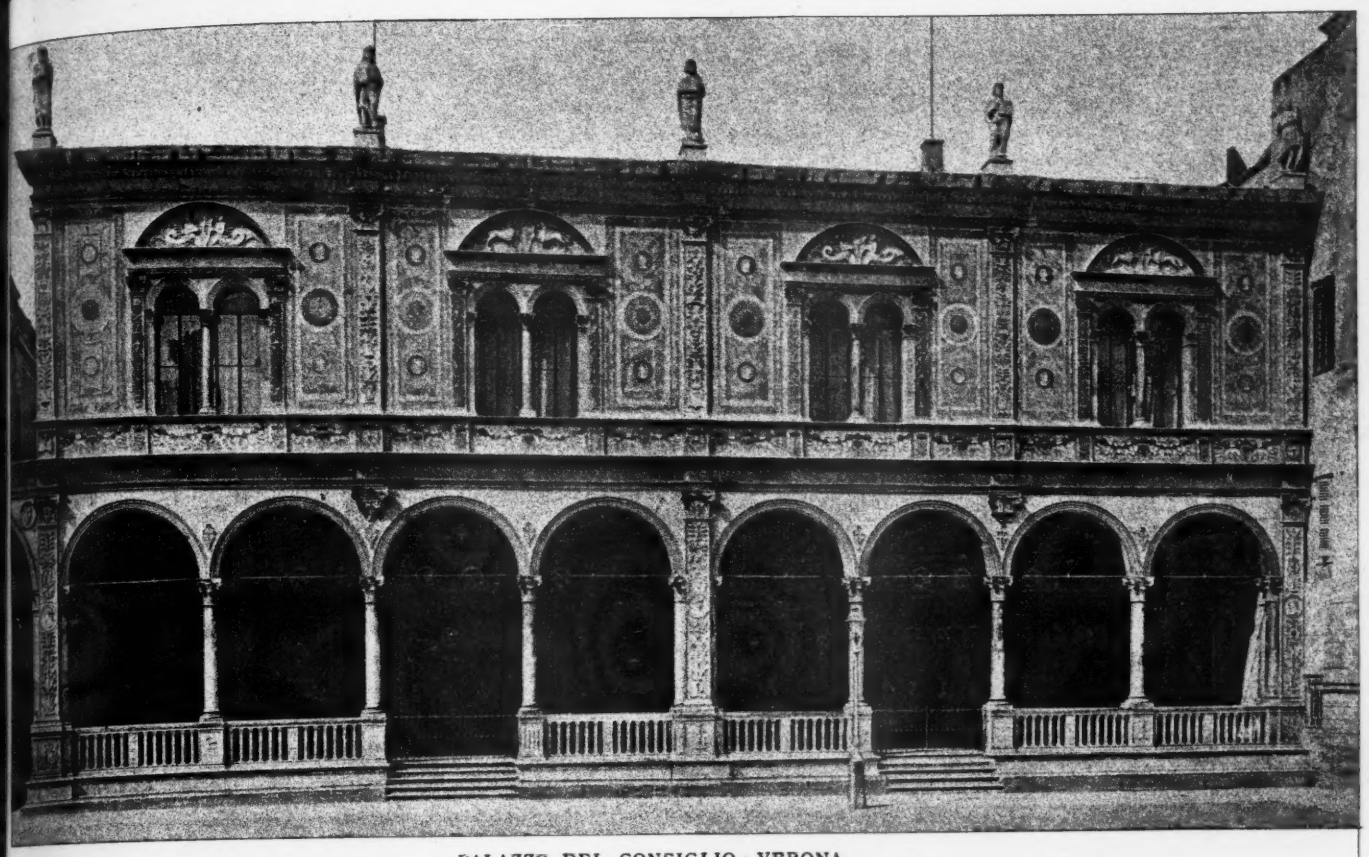

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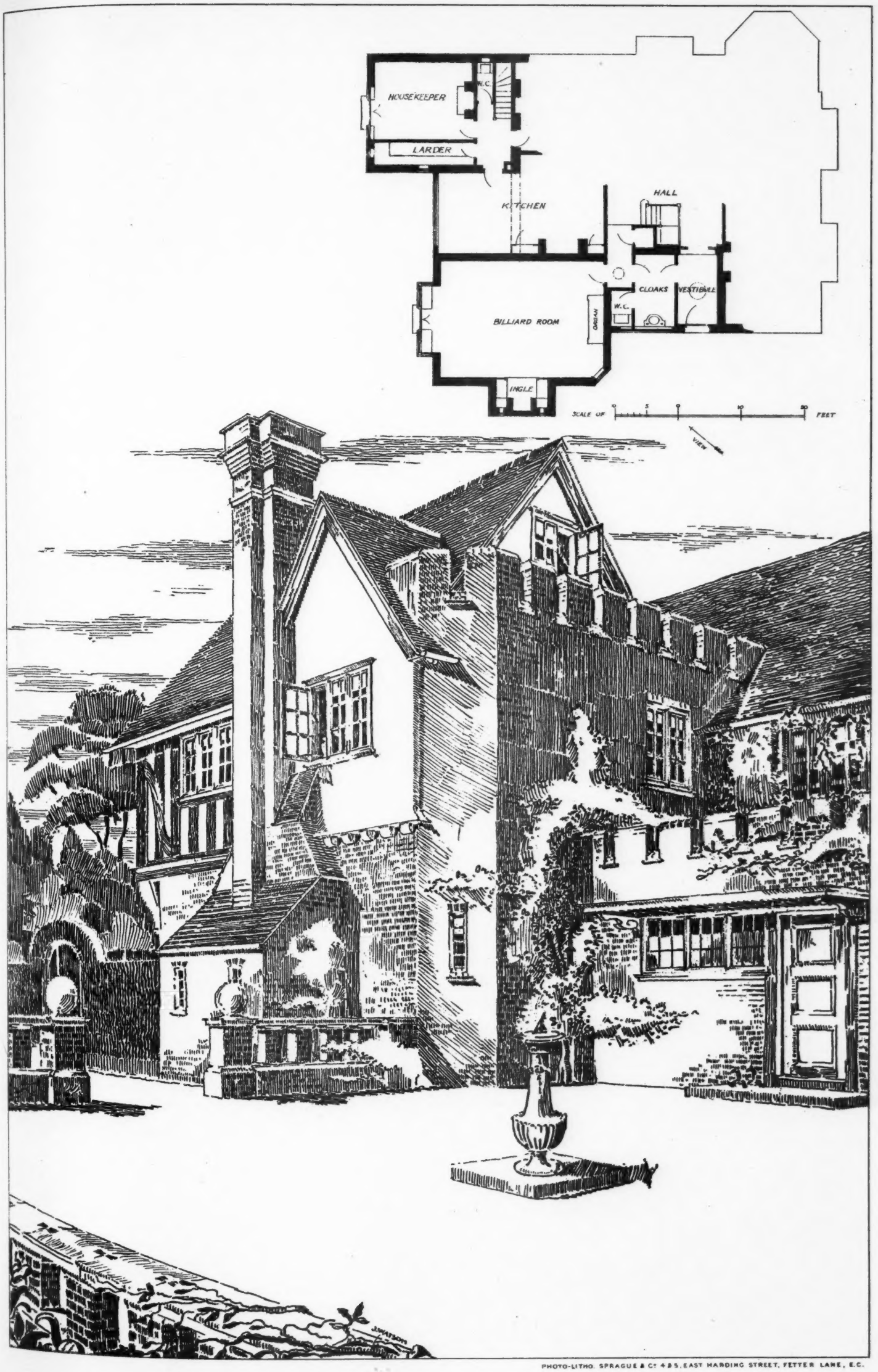

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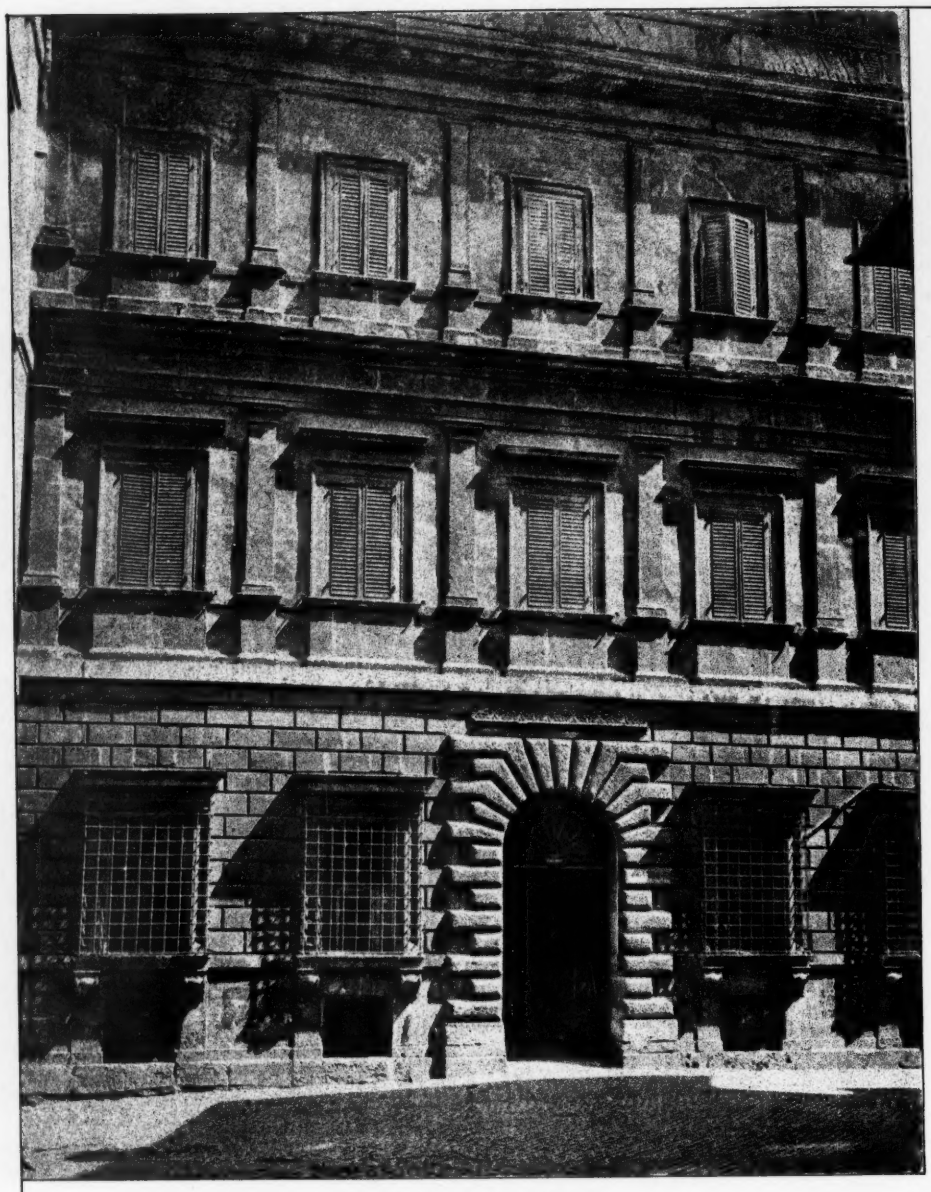

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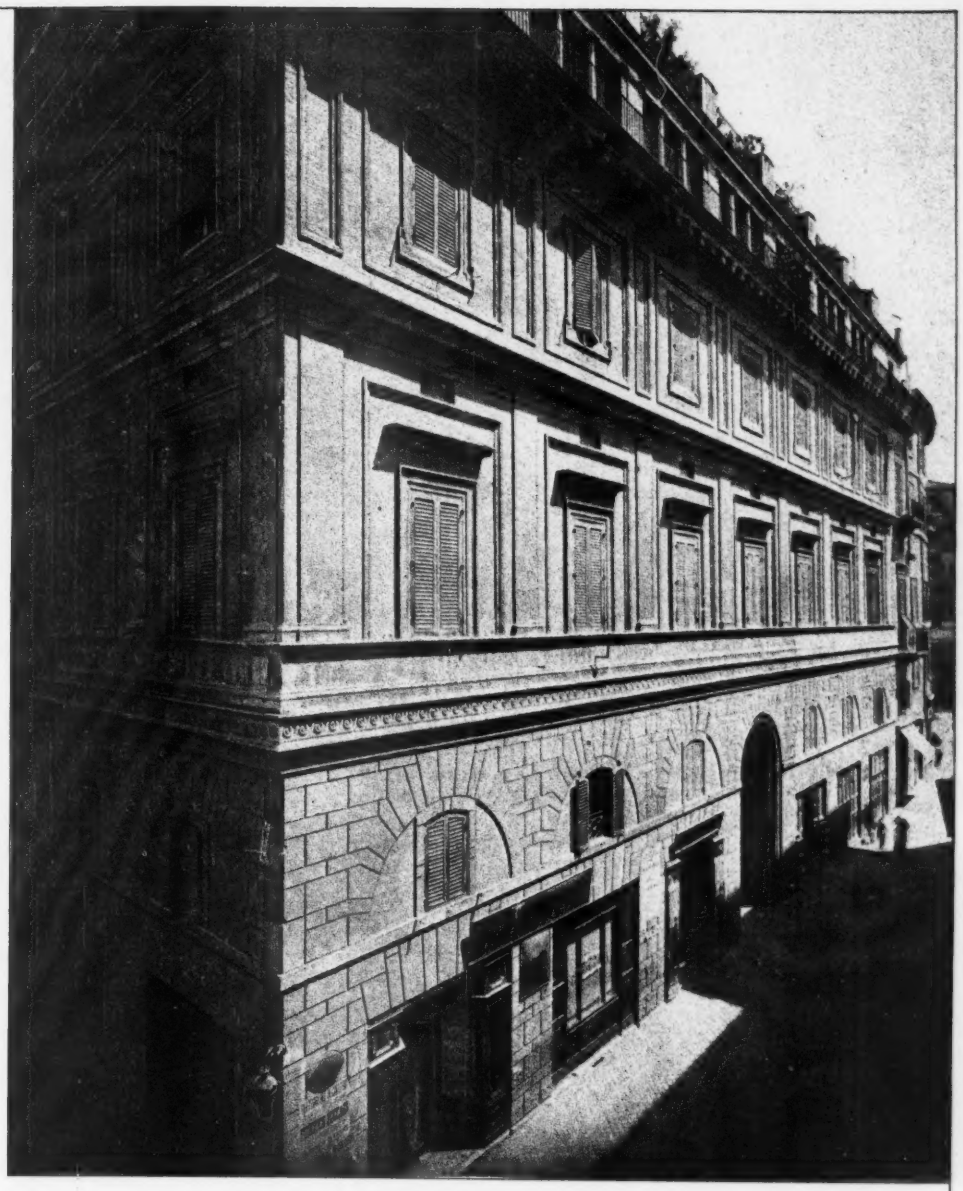

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